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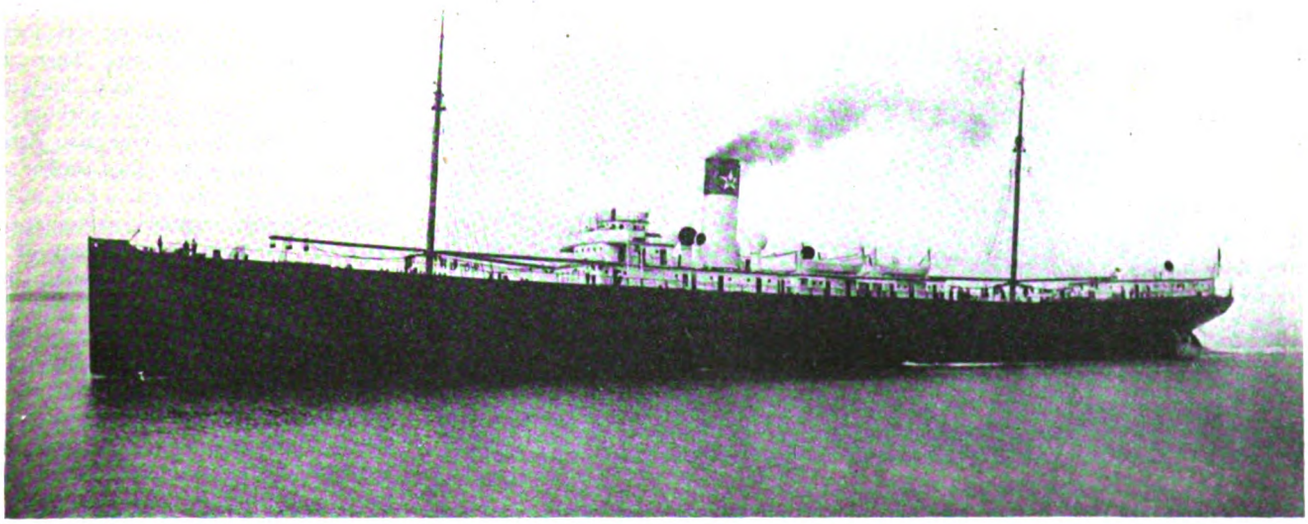
NEW FREIGHT STEAMSHIPS FOR THE SOUTHERN PACIFIC CO.

THERE have recently been completed at the yard of the Newport News Shipbuilding & Dry Dock Co. the first two of four duplicate freight steamships, being built for the Southern Pacific Co.'s Atlantic Steamship Lines for trade between New York and Galveston, Texas. The names of the vessels already completed are El Sol and El Mundo and their sister ships are named El Oriente and El Occidente.

Their principal dimensions are as follows:

Length over all, 430 ft.; length on load water line, 412 ft.; beam, molded, 53 ft.; depth, molded, to hurricane deck, 36 ft.; depth, molded, to main deck, 28 ft.

They are single-screw steel steamships of the ocean-going, hurricane deck type, with straight stem and semi-elliptical stern, and are schooner rigged with two steel pole masts. There are three complete decks to the hull and a partial orlop deck forward. All accommodations are located above the hurricane deck, in steel deck houses, those for the officers and engineers amidships and those for the seamen and firemen aft. There is a double bottom under the engine room and thrust recess, the compartments of which are used for carrying fresh water for boiler feed, elsewhere the ordinary type of single bottom construction is used. The hull is sub-



S. S. El Mundo, of the Southern Pacific Co.'s Fleet.

divided into compartments by six watertight bulkheads, in addition to which there are also two non-watertight bulkheads, forming athwartship coal bunkers. The three main boilers are double-ended and are located in one compartment with two athwartship firerooms, and with one cross bunker located at the forward end and one between the engine and boiler rooms. The space abreast the machinery casings on the lower deck is also used for coal bunkers.

The general construction of the hull consists of channel side frames, all extending to the hurricane deck, complete lower and main decks of steel, and steel stringers and tie plates on the hurricane and orlop decks. The strength of the hurricane deck in way of the "over all" hatches is maintained by heavy portable stringers and two tie plates. These stringers and tie plates are rigidly connected to steel castings, which are securely fastened to the deck on the forward and after sides of the hatches. The hurricane deck is laid with a 3½-in., an the orlop deck with a 3-in., yellow pine caulked deck. On two of the vessels the main deck has a 3½-in. yellow pine caulked deck on top of the plating, this wood deck being covered with 1¼-in. yellow pine sheathing. All deck beams are channels, supported by two rows of longitudinal girders with wide-spaced stanchions. From the keel to the load water line, the shell plating is joggled; above the water line it is fitted in inside and outside strakes.

The overhang at the stern is finished with a double knuckle which, with the large amount of sheer both forward and aft, give the vessels a graceful appearance. The deck houses are of steel construction, fitted with metal doors and airports.

Quick Handling of Freight.

Economical and quick handling of freight is something which is always sought for in freight steamships, though not always obtained. On these new vessels the special arrangements provided in the way of hatches, cargo ports, wide-spaced stanchions, etc., attain this end. In each of the decks, there are four large hatches, two forward and two aft. Two of the hatches on the hurricane deck are "over all" hatches which, when opened in conjunction with the cargo ports directly underneath, afford splendid openings for the mechanical conveyors which are used in handling the cargo. These hatches are each fitted with watertight steel covers in four sections, the inboard sections being hinged. The other two hatches on the hurricane deck and the four hatches on the main deck also have hinged watertight steel covers All these steel hatch covers are handled by the cargo booms. There are four cargo ports on each side between the lower and main decks, each fitted with watertight hinged doors in two sections, divided horizontally. There are also four cargo ports on each side between the main and hurricane decks, the watertight hinged doors for which are divided vertically. These ports are all located to suit the gangways at the Southern Pacific terminals.

For handling cargo through the hatches, there are two cargo booms on each side of each mast, the foremast being located between the two forward hatches and the mainmast between the two after ones. Each cargo boom is directly attached to the mast and has a lifting capacity of 7½ tons; the length of the booms varies from 47 ft. 3 in. to 57 ft. 6 in. At each hatch on the main deck, there are located two single-drum, 9-in. x 10-in., single-cylinder winches, one for each cargo boom. These winches are all fitted with vertical shafts and gearing for driving vertical gypsies on the deck above.

Arrangements for Coaling.

As customary on vessels trading between New York and ports on the Gulf of Mexico, all the coaling is done in New York, so that bunkers of sufficient capacity for a round trip are provided. The total bunker capacity is divided approximately even between upper and lower bunkers so that on the north-bound trip the coal is all carried in the lower bunkers and the upper bunkers are available for cargo. Large hinged watertight doors are fitted in the end bulkhead of this space to make it thus available. For coaling the vessels, four hinged ports are fitted on each side, between the main and hurricane decks, through which ports coal is taken on from barges by means of buckets, handled by coaling booms, located at the hurricane deck level. These coaling booms have leads to two single-drum, 8-in. x 8-in., single-cylinder coaling winches, located in the deck house between the engine and boiler casings. A large number of 24-in. diameter coaling scuttles are fitted in the main deck, through which the coal is dumped directly into the bunkers. A number of square hatches are fitted in the lower deck for trimming coal from the upper to the lower bunkers.

Character of Accommodations.

All vessels in the Southern Pacific fleet are well and favorably known among shipping men for their fine accommodations. This high standard is maintained on the new vessels, which in some respects have more elaborate quarters than the older ones. The captain's and deck officers' quarters are in a house on top of the forward hurricane deck house and the pilot house is above the officers' deck house, a flying bridge being located at the level of the top of the latter. The captain's quarters consist of an office and separate stateroom, finished in mahogany, with a private bath off the stateroom. An officers' toilet with shower bath is also provided in the upper house. A chart room is so located as to be accessible from all officers' rooms, and an inside stairway leads directly to the pilot house above. The engineers' quarters and those of the steward, petty officers, etc., are located abreast the engine casing, separate rooms being provided for all engineers. All these quarters have doors opening out on deck and the engineers' rooms also have doors opening on passages inside the deck house. A bath tub is provided for the engineers and a separate shower for petty officers.

The captain's mess room with eight seats and an officers' mess room with sixteen seats are located in the forward end of the lower deck house. The captain's mess room is paneled in mahogany and the officers' mess room is finished with a cherry wainscoting and ash panels above. The galley is located just forward of the boiler casing and is the full width of the deck house. A pantry, steward's store room and cold storage room are located between the galley and mess rooms. Separate mess rooms for firemen and seamen are located in the deck house at the sides of the boiler casing.

All quarters throughout the vessels are heated by steam and lighted by electricity. The electric plant consists of two 10-k. w. General Electric Co.'s direct connected marine generating sets, located in the lower engine room. There is a Hyde steam windlass with horizontal wildcats for handling the anchors and chains, the windlass engine also driving two warping capstans. Two similar capstans, driven by a reversible 8-in. x 8-in., double-cylinder, capstan engine, are located aft. Steam steering gear of the screw gear type is fitted, the engine having double cylinders, 10-in. x 8-in., and being controlled from the pilot house and also from the warping bridge, located at the level of the top of the after deck house. Hand-steering gear of the right and left hand screw type is located in the after deck house.

Propelling Machinery.

The propelling machinery consists of a triple-expansion engine and three double-end Scotch boilers, fitted with heated forced draft. The cylinders are 34½

in., 57 in. and 96 in. diameter respectively, and have a common stroke of 60 in. A separate liner is fitted in the h. p. cylinder. One piston valve is fitted for the h. p., two-piston valves for the m. p., and a double-ported slide valve for the l. p. All valves are worked by Stephenson double-bar link motion, fitted with the direct type of steam reversing gear. Cast iron pistons are used in the h. p. and m. p. cylinders, and a cast steel piston in the l. p. cylinder. Piston rods, cross-heads, and connecting rods are forged steel, the cross-heads have double slippers of cast iron, lined with white metal. The cylinders are supported by cast iron housings of box section, and the bed plate is also cast iron, made in three sections. The crank shaft is of the built-up type in three interchangeable sections. A horseshoe type of thrust bearing is fitted and all shafting is forged steel. The propeller is sectional with a cast steel hub and four manganese bronze blades. An "Edwards" type air pump and two bilge pumps are driven from the l. p. crosshead; all other pumps are independent, as is also the surface condenser. The latter has a steel cylindrical shell with brass tubes tinned inside and out, which give a cooling surface of 9,300 sq. ft. Water is circulated through the condenser by an independent centrifugal pump, driven by a single, 12-in. x 12-in. engine. The circulating water enters the bottom of the condenser and discharges at the top.

All steam pumps are Blake and Knowles make, and comprise two main feed, one donkey, one sanitary, one deck service, and one oil pump. There is also a Reilly feed water heater and a Ross grease extractor.

The three main boilers are each 15 ft. 3 in. diameter x 22 ft. long, built for a working steam pressure of 200 lbs. Each boiler has eight 39-in. furnaces with separate combustion chambers, and 764 2¾-in. tubes. The total heating surface of the three boilers is 15,630 sq. ft., and total grate surface 410 sq. ft.

The uptakes are fitted with air heating boxes as customary with heated forced draft installations, and all boilers are connected to a common stack. For the forced draft, there are two Sturtevant fans of 60,000 cu. ft. capacity per minute each, one located in each fire room in a recess in the coal bunkers. These fans draw air from the fire rooms and discharge into the ducts around the air heating boxes, the ducts being so arranged that each fan discharges air to all the furnaces in the fire room, in which it is located. For discharging ashes overhead, there is fitted in each fire room one 6-in. See hydro-pneumatic ash ejector. A Williamson ash hoisting engine with 3½-in. x 3½-in. cylinders is also provided in the after fire room. A donkey boiler, 12 ft. 6 in. diameter by 10 ft. long, is provided for use in port. This boiler has three 39-in. furnaces, 58½ sq. ft. of grate surface, 1,541 sq. ft. of heating surface, and is built for a working steam pressure of 200 lbs.

Speed Requirement.

The contract for these vessels requires them to maintain an average sea speed of 15¼ knots for the round trip between New York and Galveston, when loaded with 4,000 long tons of cargo, in addition to fuel, water,, stores, etc., the coal consumption not to exceed 1.6 lbs. per i. h. p. per hour. On her maiden trip, the El Sol averaged over 16 knots for the round trip, and the coal consumption for the trip averaged less than 1½ lbs. per i. h. p. per hour. This excellent showing is naturally very gratifying both to the owners and to the builders.

The contract for these four vessels is the fourth order of four vessels each, which have been given the Newport News company by the Southern Pacific company.

The Newport News company also built the freight and passenger steamships, Comus and Proteus, for the same owners, this making a total of eighteen large vessels they have built or are building for the Southern Pacific company. The fourteen vessels, previously built, were all built from the same model, and are 390 ft. long x 48-ft. beam x 33-ft. 9-in. depth, fitted with machinery of 4,000 i. h. p., which enable them to maintain a service speed of 14½ to 15 knots. Of these vessels, all are now in the Southern Pacific company's fleet, with the exception of the first four built, which were sold to the United States Navy during the Spanish war, and converted into the auxiliary cruisers, Yosemite, Yankee, Dixie and Buffalo.

Interesting British Salvage Feat

SALVAGE people and engineers in Britain have been much interested quite recently in the raising of the Mersey docks and harbor board dredger, Walter Glynn, which capsized in the Mersey during a heavy gale in the early part of September. The lift is the heaviest which has taken place on the Mersey, seeing that the dredger after being dismantled as much as was possible weighed over 1,500 tons, and the system adopted by the docks board's skilled salvage officers was something like that which proved so successful in the raising of the Gladiator. Fig. 1 shows the vessel as she lay on her port side at low water, and unfortunately very close up to the river wall near the Seaforth

FIG. 1—MERSEY DOCKS BOARD DREDGER, WALTER GLYNN, CAPSIZED.

battery. Fig. 2 depicts the final effort to right the dredger. "Humps" or camels were pinned to the vessel at low water, so that when the tide rose they

FIG. 2—SHOWING THE DREDGER BEING LIFTED.

would lift her, while wire cables were attached to the dredger to enable powerful steam winches ashore to pull her on to an even keel. The winches ashore were embedded in concrete to a depth of 14 ft. and on the surface attached to the inside of the piles was a heavy green heart log which was intended to bear the strain of the purchase on the parbuckling wires that were used for the uprighting process. The wires from the shore winches were led over the dock wall and were made fast to the dredger on the port side on which she lay. While the enormous purchase was in operation from the shore the dock board's powerful new lifting camels of 1,000 tons capacity each with the assistance of other salvage craft were made fast with wires ranging from 200 to 230 tons breaking strain. The preparations for lifting were so carefully made that the salvage was a complete success, the dredger being placed on an even keel at the first attempt, as shown in Fig. 3.

A Big Dry Dock

The Clyde Navigation Trustees have just adopted plans for the new graving dock which has become necessary to meet the growing requirements of the port. The trustees have been assured by the British admiralty that the proposed dock would be suitable for ships of the largest type. The dimensions of the dock are 1,020 ft. long on the floor, divided into two sections of 600 ft. and 420 ft., the width of the entrance being 100 ft., and the depth on sill at average high water, spring tides, 36 ft. These dimensions may, if it is thought wise, be increased at a later stage. The capital cost is estimated roundly at $2,500,000.

FIG. 3—SHOWING THE DREDGER UPRIGHTED.

ORGANIZATION OF A NAVY YARD SAIL LOFT AND FLAG SHOP

By Holden A. Evans.[1]

IN PREVIOUS articles in THE MARINE REVIEW[2], I have described the organization of some navy yard shops in which at least some of the principles of scientific management have been followed.

In the sail loft, awnings, hammocks, sails, coaling bags, clothes bags and similar canvas work, are manufactured and repaired. In the flag shop, flags of all nations, curtains, table cloths, table linen and similar work, are manufactured and repaired.

In the sail loft skilled sailmakers are employed at $4.50 per day, very few of whom have worked with machines, and all work was previously done by hand. In the flag shop are employed women at $2.25 per day, nearly all of whom are expert machine hands, and a great part of the output is machine work.

In these two shops the character of the labor differs greatly, yet the same organization and the same system of work has been followed and excellent results obtained in both shops.

NO. WANTED 100 JOB ORDER NO. 2614-R

ARTICLE COALING BAGS 800 LBS.

MAT. ORDER 5-7-10 RECEIVED 5-10-10 DIR. LAB. 202.88 MAT. 951.93 TOTAL 1154.81

PART	ROUTE	OPERATION	CHECK NO	ISSUED	COMP	HOURS
CANVAS & TAPE SIDES AND BOTTOM	1	CUT OUT ALL MATERIAL	3303	5-12	5-14	12
	2	DIAGONAL STITCH	3308	5-16	5-22	42
		JOIN, ROPE & FINISH-20 BAGS	3319	5-25	6-2	60
		" " " " " "	3323	"	"	58
ASSEMBLED PARTS		" " " " " "	3324	5-26	6-4	59
		" " " " " "	3327	"	"	61
		" " " " " "	3310	"	6-6	69

FIG. 1—ROUTE SHEET. THIS IS AN ENVELOPE AND SERVES AS A FILING POCKET FOR THE INSTRUCTION CARDS.

In this article will be described the organization of two shops, the product of which is somewhat unusual. The results which have been obtained in these shops by better methods are far beyond expectations.

[1]Naval Constructor, U. S. Navy.
[2]MARINE REVIEW, Sept., 1910.

Volume of Work Necessary.

The steel makers seek to increase tonnage to enable them to increase efficiency and reduce costs. For the same reason government shops require more work to maintain efficiency, which has been improved by better methods. In a commercial shop increased efficiency lowers costs, and enables selling costs to be shared a sufficient amount to bring more business and keep the plant fully occupied, and the workmen who have assisted in reducing the costs are assured a steady job. Not so in a government plant. There is no increase of work on account of reduction in costs, and this the employes fully understand. They know that, generally speaking, the quantity of the work will be the same whether the cost be high or low, and they view every change which tends towards efficiency as a factor which may work them out of a job. This is one of the reasons why government plants with splendid equipment cannot compete with private plants with poor equipment. It is the chief reason why it is so difficult for a navy yards manager to build up an efficient shop organization.

I have experienced these conditions in every shop where a serious effort has been made to improve the efficiency. In fact, I have usually found that when a navy yard shop is thoroughly studied and systematized that the out-

CHECK No. 3319 JOB ORDER No. 2614-R

ARTICLE 20-COALING BAGS-800 LBS

ISSUED 5-25 1910 COMPLETED 6-2 1910 BY Sorenson

INSTRUCTIONS

Join, rope and finish 20 Coaling bags 800 lb.

DATE	RT.	HR.	DATE	RT.	HR.	DATE	RT	HR	DATE	RT	HR	DATE	RT	HR.
5-25	56	4	5-31	56	8									
5-26	"	8	6-1	"	8									
5-27	"	8	6-2	"	8									
5-28	"	8												
5-30	"	8												

FIG. 2—INSTRUCTION CARD ISSUED TO THE WORKMAN.

CHECK No. 3303 JOB ORDER No. 2614-R.

ARTICLE 100-COALING BAGS-800-LBS.

ISSUED 5-12 1910 COMPLETED 5-14 1910 BY J.O.B

INSTRUCTIONS

Cut-out sides and bottoms, roll and crease. Cut ropes to length for 100 Coal Bags. 800 lbs

DATE	HT	HR	DATE	RT	HR	DATE	RT	HR	DATE	RT	HR	DATE	RT	HR.
5-12	62	2												
5-13	"	8												
5-14	"	2												

FIG. 3—INSTRUCTION CARD ISSUED TO THE WORKMAN.

put is so greatly increased that, notwithstanding large reductions in the force, it is difficult to find sufficient volume of work to keep the shop up to the new standard.

The sail loft and flag shop are no exceptions to this rule. In the sail loft all work had been done by hand, even plain seaming, and there was not a machine in the shop. With no reduction in the amount of work to be done, the introduction of machines and the better organization of the shop reduced the number of men by half and it was not possible to keep this number continuously employed. In the flag shop it had been the boast of the shop that there had been no reduction in the force for five or six years. Soon after this shop came under my supervision it was studied and systematized, and with no reduction in the amount of work accomplished the force was cut in half.

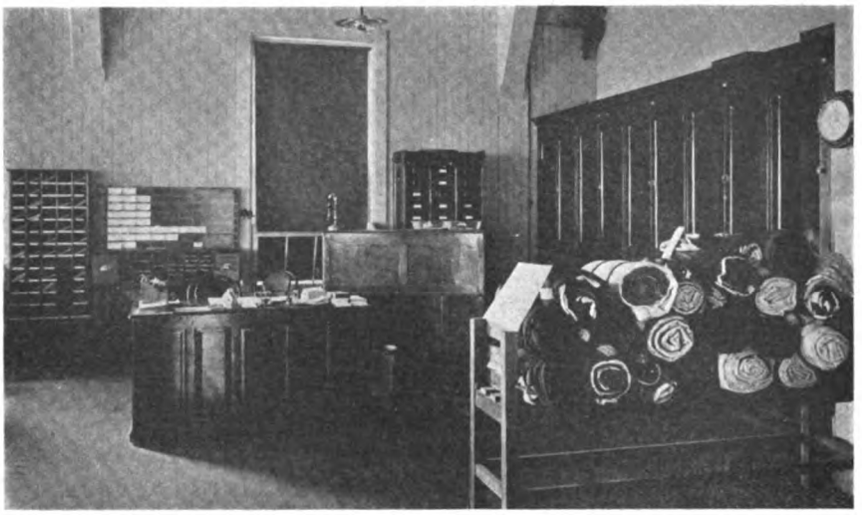


FIG. 4—OFFICE OF FLAG SHOP. STANDING ORDER BOARD ON THE LEFT. INSPECTION TABLE ON THE RIGHT.

In these two shops, if additional volume of work can be provided, the efficiency can be further increased. Without the additional work the tendency will be to restrict the output as much as possible in order that there shall be no further reduction of the force.

No Opposition from Foremen to Improvements.

In these two shops there was no opposition from the foremen to changes. They knew that the new management had made improvements in other shops and they knew that this had been done in spite of opposition. They had also learned that the management while lowering costs, did not ask the impossible, and that it was the aim to do exact justice to every employe. These foremen, therefore, were willing to be shown that there was another and more efficient way of operating the shop, and they gave effective co-operation.

An assistant, J. M. Willis, who had been employed under my supervision for three years in shop improvement work, was assigned to this work, and the re-organization and the satisfactory results obtained were accomplished under his immediate supervision.

Separation of Work Into Elements.

Here, as elsewhere, no attempt had previously been made to separate the work into elements, and to give each part to those best qualified for that class of work. For example, in making an intricate foreign flag, the whole job was assigned to one worker, who laid out the design, did the cutting, basting, stitching, embroidering, heading, pressing and folding. Under the new system the work was divided into the following sections: marking, cutting, basting, machining, heading and pressing; and to each section was assigned the workers best qualified for each class of work. In the sail loft similar conditions were found and similar changes were made.

Routing Work.

All work is carefully planned and routed, and written instruction cards issued. All material necessary for a job is assembled before the work is undertaken, and is delivered to the proper section at the right time. The standing order board, material order sheets, instruction card holders, etc., are the same as those described in previous articles, and no further description is given. The route sheet and instruction card differ from those used in other shops and previously described. A great deal of the output is duplicate manufacture work, and it is desirable to have accurate record of the times taken on the various operations, and also the direct cost, in such shape that comparisons can readily be made of the work accomplished. The route sheet (Fig. 1) is an envelope, on the front of which in appropriate columns the order is recorded, the operations are defined, and the assignment of the work made. When the work is completed, the dates of completion are entered and also the time taken for each operation and the total direct cost of the job. This envelope forms an excellent pocket for filing the completed instruction cards, bills of material, and other data regarding the job, the condensed information being given on the outside.

FIG. 5—FLAG SHOP. MARKING, CUTTING AND DESIGN DEPARTMENTS. NOTE INSTRUCTION CARDS AND TIME TICKETS FOR EACH WORKER.

The instruction card (Figs. 2 and 3) contains a description of the work required and has blanks in which the

workman enters his time each day until the job is completed. After the work has been inspected, the time and direct cost records are compiled from these cards and entered on the route sheet envelope and the cards are filed in the envelope. The condition of the work in the shop is shown on the standing order board, and it is by means of this board that the foreman is able to follow up the work and properly route new work.

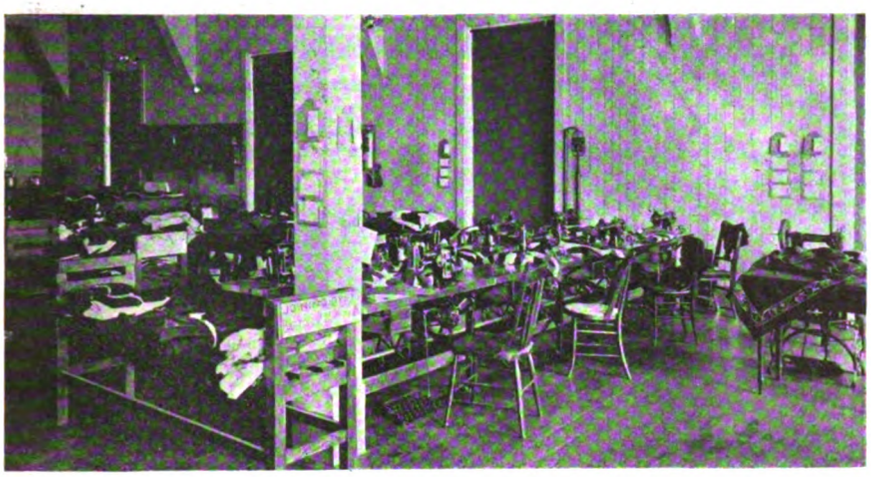


FIG. 6—FLAG SHOP. BASTING AND MACHINE DEPARTMENTS. ALL MACHINES ARE MOTOR-DRIVEN.

Division of Work in the Sail Loft.

After the introduction of machines, the work in the shop was distributed among four departments, as follows:

(1) *Laying Out and Cutting.* This work is done under the immediate supervision of the foreman. One man does practically all laying out, cutting and the preparation of material before it goes to the operators.

(2) *Machine Department.* This includes all stitching where it is possible to use a machine.

(3) *Finishers.* Includes all finishing on the work which has passed through the machines, such as hand stitching, roping, working eyelets, grommets, rings, etc.

(4) *Hand Workers.* Includes all hand work where no part of the work is done by machine.

Flag Shop Organization.

The organization of the flag shop and the system followed is in every respect similar to that of the sail loft, except that the sub-departments are not the same. The character of the work and the various departments are shown in the photographs. (Figs. 4 to 9.)

Results Obtained.

The increase in output per worker has been very large. As this increase has been obtained under the day work system, without any pecuniary reward to the worker, the results are remarkable, and the causes are worthy of consideration. In these shops, as in the usual day work shop, no record was previously kept of the output of each worker each day. There was no way in which the manager could obtain the relative efficiency of each man other than the statement of the foreman. The same conditions exist in many shops; the foreman knows his best men and his worst men, but the majority are between these extremes and are generally classed as equal and, in case of a reduction of the force, frequently better men are discharged than those retained. Again, under these conditions, there is opportunity for favoritism which is in many cases exercised. In government shops it is usually the new man who is laid off and the older worker who is retained, notwithstanding the fact that in many cases the new man is superior to men previously employed. The workmen see no relation between the efficiency of the man and his retention.

No Attempt Made to Drive the Men. The Record Shows What Each Man Does Each Day.

In the re-organization of the two shops under discussion, no attempt was made to drive the men. In no case were the men told that the output was small, or that it should be increased, and only in one case was there an intimation that the management was not satisfied with the amount of work done.

As soon as the work was in some degree systematized, a record of the daily output of each man was made. The men themselves made these records, and they could not dispute them. The men knew from the attitude of the management in other shops that discharges would be based solely on these records, and that each man must work out his own salvation. As improvement was made and the output increased it was soon evident to the men themselves that it would be necessary to reduce the force. Previously practically all of the sailmakers in the immediate vicinity had been employed and the first cut in the force brought out the fact that it is difficult to ob-

FIG. 7—FLAG SHOP. EMBROIDERY MACHINE AND SAMPLE OF WORK.

tain work in this district. With still further improvement a second small reduction was necessary, and this left about half the original force. These men are all excellent mechanics, who can produce a large output. The majority of these owned their homes in, and had strong ties binding them to, the vicinity, and they knew that if they lost their jobs that they would have to leave their homes to obtain work. This brought about keen competition between the men, and resulted in a very large output. These conditions make this shop an exception to the usual government shop, but nevertheless the results are disheartening both to the men and the management. There is finally left a splendid small body of men who, because of increased efficiency have increased the output so largely that there is not enough work to provide permanent employment.

The conditions in the flag loft among the women workers were very similar, and the results were the same.

Reductions Made in Cost.

To show what has actually been accomplished, a few of the time reductions made are given below, the names of the workmen being omitted:

Time Taken in Making Standard Navy Hammocks in Lots of Ten. All Work by Hand. Machine Work Not Allowed. Times Given Are in Minutes For One Hammock.

Workmen.	Time taken First records.	Date. 4-13-10	Date. 4-16-10	Date. 4-20-10	Date. 4-22-10
1	120	78	72	72	..
2	120	78	78	78	..
3	120	90	90	90	..
4	120	90	84	84	..
5	120	90	84	84	..
6	120	96	84	90	..
7	120	102	102	90	..
8	120	120	120	108	72
9	120	120	120	108	72
10	120	120	120	108	90
11	120	120	120	96	84
12	120	120	120	120	90
13	120	120	120	96	96
14	120	120	120	96	96

These figures are interesting. Note that workmen 1 and 2 made a marked reduction at once; 3, 4 and 5 did very well, while 6 and 7 held back. Workmen 8 to 14 determined at first that they would make no cuts, but later, facing the work done by the other men, their resolution failed and a moderate cut was made. It was then the one time that the management indicated that better output was expected. A new lot of ten hammocks was ordered of each of these men (Nos. 8 to 14). The man's check number on the instruction card was written in large red figures and the word "Conditional" was written across the face of the card in large red letters. Nothing was said to the men, but it was seen as soon as the instruction cards were issued that the men understood the warning. Nos. 8 and 9 equaled the best records, while 10, 11 and 12 made considerable improvement; 13 and 14 did not improve and were later discharged. Considerable further reduction can be made by substituting machine work for hand work, but at present the specifications prescribe hand work.

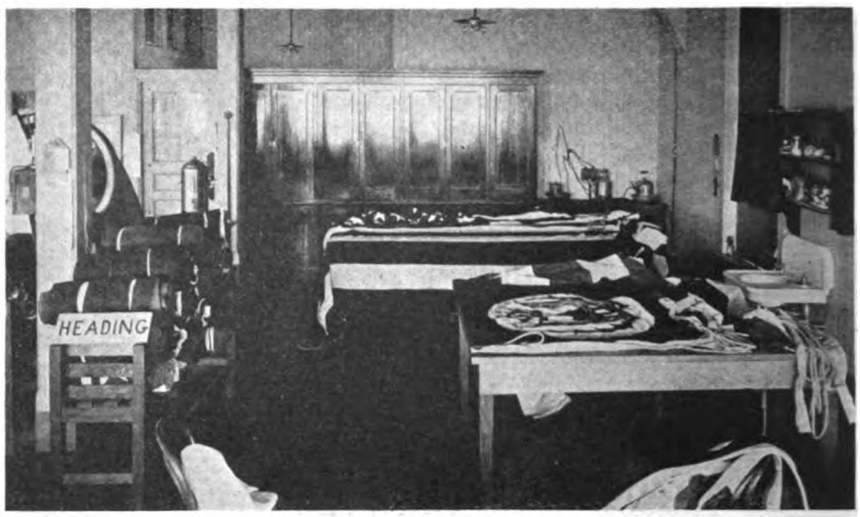


FIG. 8—FLAG SHOP. HEADING DEPARTMENT. NOTE ELECTRIC HEATERS TO ENABLE WOMEN WORKERS TO MAKE TEA DURING THE NOON HOUR.

The reductions made reduced the cost of hammocks 75 cents each, and as large quantities are required, 2,000 for a single large ship, the saving affected is considerable.

The time required in making clothes bags, 2,000 of which are required for each large ship, was reduced from 60 minutes each to 36 minutes each.

The most interesting reduction, however, was made in the manufacture of 800-lb. coaling bags, shown in Fig. 10. The record of the times, taken after the material is prepared, is as follows:

Workmen.	Times first record.	Date 3-5-10	Date 4-6-10	Date 5-10-10	Date 5-16-10	Date 6-2-10	Date 6-15-10
1	390	190	...	180	180	171	132
2	390	210	195	188	180	174	156
3	390	220	214	188	180	180	156
4	390	225	210	206	180	177	...
5	390	240	206	...	180	180	132

For exactly the same work it will be seen that the time was reduced from 390 minutes per bag to 132.

Cutting out, folding and creasing, and cutting ropes to length, in lots of 100, require seven minutes each; diagonal stitching the sides and bottoms

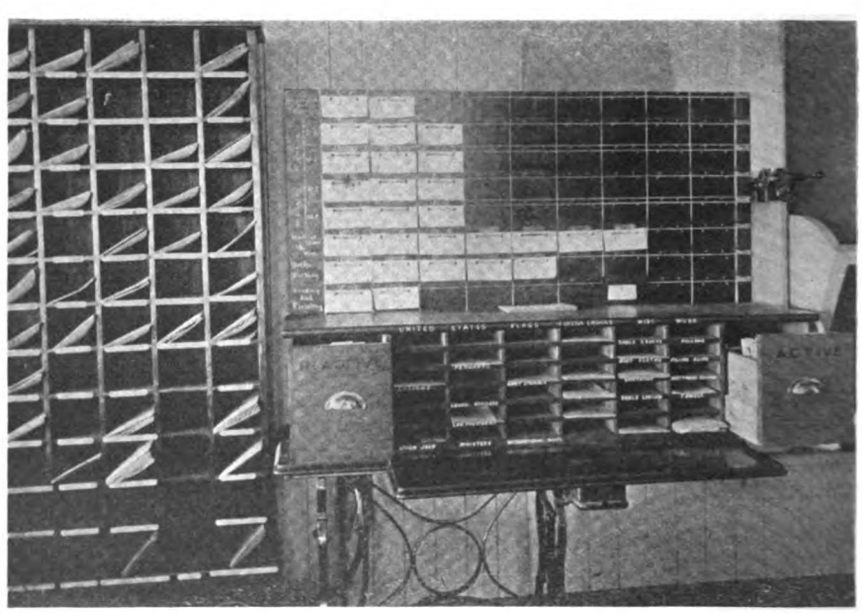


FIG. 9—FLAG SHOP. STANDING ORDER BOARD. THE FOREMAN CAN KEEP TRACK OF ALL WORK BY MEANS OF THIS BOARD. A SIMILAR BOARD IS USED IN THE SAIL LOFT.

on the machine in lots of 100 take 25 minutes each. The total time taken by the best workers to make a bag complete is therefore 2 2/3 hours. When the diagonal stitching is done by hand, the time for each bag is 3¼ hours. These bags are well made, being subjected to very hard usage in coaling ship, 800 lbs. of coal being hoisted in each bag. From the photograph the amount of work involved can be seen, and it must be admitted that to make one of these bags by hand in 3¼ hours requires skill and hard work. It is not believed that this time can be materially reduced by piece-work, and if these results are maintained there is little or no advantage, so far as this particular work is concerned, in either piece-work or the premium system. Two years ago 12 hours was taken to manufacture a bag, while a year ago it took eight hours, and this time has now been reduced to less than three hours. As the pay of sailmakers is 58 cents an hour, the saving effected is very large. Similar reductions have been made in other classes of manufacture work, and also in all repair work.

It is difficult to believe that such large reductions can be made in work of this character, but the records are vouched for, and the performances described can be duplicated at any time. This is simply some additional proof that analysis and study of work in any shop where the usual conditions prevail will result in enormous reductions in cost.

FIG. 10—EIGHT HUNDRED-POUND COAL BAG, MADE ENTIRELY BY HAND IN 3¼ HOURS. FORMER TIME, 12 HOURS.

Volatile Matter of Coal

Washington, D. C., Nov. 10.—The volatile matter of coal is the title of the first bulletin to be issued by the new federal bureau of mines. The authors, Horace C. Porter and F. K. Ovitz, conducted their investigations at the Pittsburg station while it was under the technologic branch of the geological survey, the work being a continuation of the fuel investigations begun several years ago at the Louisiana Purchase Exposition, St. Louis, Mo. The results obtained at that plant showed that the work of determining the fuel values of the coals and lignites in the United States with a view to increasing efficiency in their utilization would be incomplete if it did not include systematic physical and chemical researches into the processes of combustion. Hence in their later investigations the authors carried on such researches, concentrating attention on those lines of inquiry which promised results of greatest economic importance. This bulletin is therefore a report on an investigation of the volatile matter in several typical coals —its composition and amount at different temperatures of volitilization.

Quoted directly the authors say: "The investigation has already shown that the volatile content of different coals differs greatly in character. The volatile matter of the younger coals found in the West includes a large proportion of carbon dioxide, carbon monoxide, and water, and a correspondingly small proportion of hydrocarbons and tarry vapors. The older bituminous coals of the Appalachian region yield volatile matter containing large amounts of tarry vapors and hydrocarbons, difficult to burn completely without considerable excess of air and a high temperature. Coal of the western type, moreover, gives up its volatile matter more easily at moderate and low temperatures than that of the other type. The volatile matter produced at medium and low temperatures is rich in higher hydrocarbons of the methane type, such as ethane and propane, which contain a larger portion of carbon than is present in methane.

"These facts help to explain the difficulty of burning Pittsburg coal, for example, without smoke, the low efficiency usually obtained in burning high-volatile western coals, the advantage of a pre-heated auxiliary air supply introduced over a fuel bed, and the advantage of a furnace and boiler setting adapted to the type of fuel used. They bear directly also on the question of steaming 'capacity' of coal for locomotives, the designing and operation of gas producers for high-volatile fuels, and the operation of coke ovens and gas retorts.

"The results show further that certain bituminous coals of the interior and Rocky Mountain provinces give promise of good yields of by-products of coking, notably ammonia and high candle power gas, comparing favorably in these respects with the high grade coking coals of the eastern province.

"They show also that inert, noncombustible material is present in the volatile products of different kinds of coal to an extent ranging from 1 to 15 per cent of the coal."

The bulletin will be of interest to fuel engineers, designers and builders of gas producers, and others.

AIDS TO NAVIGATION ON THE PACIFIC COAST

IN CONSIDERING the aids to navigation, or rather the lack of them, on the Pacific coast, THE MARINE REVIEW will consider the question as a whole under the following heads: (1) Physical description; (2) Traffic; (3) Why the present aids are insufficient; (4) Effect on the development of the Pacific coast; (5) Where the trouble lies. As the Pacific coast of North America extends some 14,000 miles, physical divisions will be taken up in turn. The present article will deal with the waters of the coast from Puget Sound northward, including Alaska.

The Pacific ocean and its tributaries bound Washington, British Columbia and Alaska on the west. Washington state lies between the parallels of 45-32 and 49° latitude and the meridians of 116-57 and 124-48 west longitude. The territory or district of Alaska comprises the northwest extremity of North America, west of the 141st meridian, and a strip of the coast south to 56° of latitude, with many small and some large islands. Its area is about 590,000 square miles, and inlets and islands included, the coast line is about 26,000 miles long. From Nome to the farthest point south the coast line may be estimated at 20,000 miles. The outermost of the Aleutian islands is as far west of Skagway as that city is west of New York.

From the entrance to the strait of Juan de Fuca, northward through Puget sound, past British Columbia and into Alaska waters, is a coast line as dangerous and difficult as it is unique and beautiful. Puget sound is an arm of the Pacific ocean indenting the coast of Washington and connecting the waters on the two sides of Vancouver island.

Great Series of Islands.

North of Puget sound, beginning with Vancouver island, is a series of islands adjoining more or less closely the coast line, and including Queen Charlotte islands, off the coast of British Columbia, and from Dixon's Entrance, at the southernmost point of the Alaskan coast, to the head of the Lynn canal, a district known as the coast islands of southeastern Alaska. In a distance of 300 miles are here included the numerous islands comprising the Alexander archipelago. In the confines of the archipelago, bounded on one side by the north arm of North America and on the other by the Pacific ocean, is a series of channels and passes unequaled in the geography of the world. Contained herein is the Alaska port of entry, Juneau, and the sub-ports of Ketchikan, Wrangell, Sitka and Skagway.

Through this region a vast traffic is and has been carried on. What has the government done to provide safety for the lives of the men and the value of the cargoes that trust themselves in the routine of their duty to these waters? Practically nothing. On the Pacific coast, comparatively speaking, little has been accomplished in the way of aids to navigation, and the need is great. Some of the principal points are not even equipped with lights, in fact, at one important port on the California coast, San Pedro, where the government has just finished a waterbreak costing millions, the steamship company making regular calls has established and maintains at its own expense, a light and bell for the protection of its ships. The condition of the Alaskan coast waters, particularly southeastern Alaska, is deplorable. Why? The scope of this article is to set forth the general facts and the reasons therefor.

A Country of Vast Distances.

Physically, Alaska is a country of vast distances, unknown and undeveloped possibilities. The shores of the Arctic and Bering sea are flat and low, with a broad offing of shallow water and few places where a ship may closely approach the land. The south coast, however, is mountainous, the continuation of the littoral ranges of British Columbia making the sea front and the islands of the archipelago. These islands are separated by narrow and deep channels affording an almost unbroken protected waterway from Puget sound to Cross sound. The precipitous coast is deeply indented with fiords, at the head of which glaciers come down to the water, and continually give off small bergs.

While protected from the ocean itself, these deep channels are under certain conditions themselves very dangerous. The passages are numerous and intricate, and thick weather, fog and snow, are not only frequent, but general, and almost constant in winter. Rocks are numerous and the tidal currents troublesome. Yet, if properly protected, navigation is not difficult, for the soundings are deep and the shores are bold.

Everything of Rugged Character.

Most of the mountains are high, rough and notched. Nearly all are covered with a dense growth of timber. The hydrographic characteristics form a parallel to the topographical outline. The rugged nature of the rocks and peaks is paralleled by numerous reefs and rocks surrounded by deep water, and the general absence of shoals. Many of the main channels and most of the minor ones have only been roughly examined. Detached boulders from the broken shores and pinnacles of rock are still frequently found unmarked. On the outside coast of British Columbia, off Puget sound and southeastern Alaska, fogs are liable to occur at any time, but are most frequent in July, August and September. Continuous fogs have been recorded lasting from two to ten days.

Smoke from the forest fires along the wooded shores often assumes alarming proportions in July, August and September on Puget sound and Georgia strait, and has extended a considerable distance seaward from Cape Flattery and up into southeastern Alaska. Smoke, combined with fog, makes a serious and almost absolute preventive to navigation under the present conditions. Tides vary from 7.7 ft. at Sitka, on the outer coast, to 14.5 ft. at Wrangell. Tidal currents and currents of all velocities are found on the course to Alaska.

The commerce of these waters for the fiscal year ending June 30, 1907, was as follows: Exports, $13,644,884, excluding gold and silver; imports of $19,536,956. Gold and silver exports amounted to $14,897,925. Salmon is the big item of export in the sum of $9,145,250.

Aids to Navigation.

Such, in brief, are the conditions and the traffic. Now what are the aids to navigation on the route of this traffic to Alaska? The most intricate

channels are marked with buoys and beacons. Generally the waters are too deep for the use of the lead line, varying from 50 to 400 fathoms. At present the navigator has to literally smell his way along, being guided in a fog entirely by his knowledge, and depending absolutely upon the echo of his whistle for his range and upon his reckoning for his location. Hardly a winter passes that one or more ships are not wrecked, and injuries from striking are common. In THE MARINE REVIEW of October, 1910, was a long list of the casualties to ships on the north Pacific coast in the last three months. In THE MARINE REVIEW of July, 1910, was an account of the salving of the Yucatan, and in October, 1910, the salving of the Princess May, which may be cited as two of the most costly wrecks of the past year. Why should this list read as it does? The answer is wholly in out-of-date and inadequate apparatus and methods of protection.

There are in all 22 lights and signals in the waters of southeastern Alaska, according to the latest available information. Seven of these 22 have fog signals, two of which are sirens, one a bell and four trumpets. Only three of them are flashing lights. One at Hog island flashes occasional white every eight seconds; one at Eldred rocks flashes alternately white and red every ten seconds, and one at Green island flashes white every five and one-half seconds. And these are all the aids to the navigator at night or in a fog, found in a distance 300 miles in length, comprising seven large and hundreds of small islands, with countless reefs and a broken shore line totaling thousands of miles. The traffic passing through these waters and the lives of the passengers as well as the crew depend almost entirely upon the intuition of the navigator for their safety. The geodetic survey charts and the light and fog signals are inadequate and incomplete, as well as being improperly provided for.

Conditions Should be Improved.

What is needed is some business-like step to improve matters at once; not to prepare some lengthy report to congress, the mere magnitude of which will cause despair; but something immediate and effective that would answer the purpose at least until the government could establish permanent beacons.

The immediate solution of the situation lies in the installation of the submarine signal bell, which is not affected by atmospheric conditions. Silent zones are common in the coast waters. These silent zones shunt and kill the sound of any apparatus that uses air as a conveying medium. A ship may pass into a silent zone and hear absolutely nothing, though it may be immediately upon a dangerous reef of rock.

There is no trouble in naming 50 stations on the Pacific coast and in Alaskan waters where danger signals are needed, but THE MARINE REVIEW submits the following list of nine stations on the Pacific coast, ten on the Alaskan coast, and 15 on the inside passages of southeastern Alaska, where there is at present no protection or insufficient protection. These stations should be equipped with the submarine bell signal at once. An appropriation of $500,000 would do this. Most especially should the work not be done piece-meal—that is the principal trouble now. It should be taken up as a whole, and a complete, comprehensive system provided.

Submarine Signals are Necessary.

The following points need signals on the Pacific coast of the United States proper:

Point Loma, Cal.; San Pedro, Cal.; Point Deception, Cal.; Alcatraz island, San Francisco harbor; Farallon island; Gray's Harbor, Wash.; Partridge bank, Wash.; and Turn Point, Wash.

On the Alaskan coast we have the Pacific Coast Steamship Co., the Alaska Coast Co., the Coast Steamship Co., and the Alaska Steamship Co., and three smaller companies, operating regular lines through to Bering Sea and northern Alaska. The following points need signals:

Cape Muzon, south end Dall island; Cape Decision, south end Kuiu island; Cape Ommany, Baranoff island; Cape Edgecombe; Cape Spencer; Cape Hinchinbrook; Uganok island, Unimak pass; Priest Rock, Unalaska island; Cape Mohican, Munivak island; Cape Nome, north side Norton sound.

Five steamship companies carrying freight and passengers operate summer and winter through the inside channels and passages formed by a chain of coast islands extending from Puget sound to Lynn channel, a distance of 1,500 miles. The following points in southeastern Alaskan waters need signals:

Tree Point; Guard Island; Ship Island; Clarence Straits; Wrangel Harbor, north end Wrangel island; Strait Island; Point Alexander; Cape Strait; Five Fingers; Yasha Island; Turnabout Island, Frederick sound; Midway Island, Stephen's Passage; Marion Island; Little Island, north of Little Island; Eldred Rock, Lynn channel. Of the 15 points here named in southeastern Alaskan waters, 11 have no protection or equipment of any kind.

Insurance Rates are High.

With the present insufficient aids, the companies operating lines are not inclined to build new or better ships, for a new vessel stands no more show of passing safely through a trip to southeast Alaska than does an old, dangerous hull. One of the reactionary effects of this condition and service is to hinder and prevent the development of Alaska coal. A number of projects under way near Controller bay are now stopped through lack of proper facilities for transportation by water and the fact that the channels are not buoyed or staked.

The lack of protection has reacted on the shipper and caused the insurance underwriters to raise their rates. Generally speaking, cargo rates on business going by the inside passage to Alaska have advanced from ¾ per cent, which was in effect last year, to 1 per cent, while that going outside has gone up from ½ to ¾ per cent. On hulls, various increases have been made, particularly on vessels taking the inside passage.

The following is from Capt. Allen, of the British steamship Henley. Writing from Manzanilla, Mex., on Sept. 26, Capt. Allen says: "Attention is respectfully called to the light and fog signal on Tatoosh island. The writer has frequently rounded that cape in thick weather and when a distance of 2 miles from the lighthouse by dead reckoning, nothing has been seen of the light at night and nothing has been heard of the fog signal either by day or night, although the weather was calm at the time, on several occasions. This dangerous cape is the rounding point to and from all ports, American and Canadian, for all ships coming from and going southward and most vessels from the westward endeavor to make it before proceeding through the Straits of Juan de Fuca. It should, therefore, in the writer's humble opinion, be provided with a powerful light and fog signal."

A Plea for Help.

The following from the Seattle *Daily Times* presents most vividly the conditions: "The crying need of the Pacific coast, especially on Puget sound and in Alaskan waters, for aids to navigation, has been brought home

during the last few months through the unusually large number of wrecks in this section and in the north. That the wrecks have not been attended with a horrible loss of life which has marked several of the past years is due largely to luck and not to general conditions. The recent mishap to the Watson, on Waddah island, points to the need of a competent fog signal at that point. Capt. J. Griffith, of the Watson, said, 'There should be at least a fog signal and, if possible, a vertical ray or other light to warn navigators of the island's position.'

"Comparing the situation on this coast with that on the Atlantic, the pitiful supply of aids for the much rockier shore line here is most noticeable. On the great lakes, even, the shipping men fare far better than those of this coast, for on Lake Superior alone are 33 lighthouses and seven life-saving stations, and on Lake Michigan 50 lighthouses and 20 life-saving stations. Either one of these lakes has more protection than the entire coast of Alaska, over 3,000 miles in length."

With the recent establishment of the new Alaska lighthouse district, the sixteenth, under the control of Com. E. H. Tillman, radical changes should be instituted and an attempt made to provide the protection necessary for the Pacific coast waters from Puget sound to southeastern Alaska.

The German Ship Yards

FOR some weeks the men in the German ship yards have been out of work, either because they have been on strike, or for the reason that they have been locked out. At this present date there is no telling which way the cat will jump—or whether it will jump at all within the next few days. It goes without saying that this condition of affairs is attended with great loss to the ship yard proprietors. Foreign yards are reaping in part the benefit of the status, as every day one reads that such and such an order for building and repairing—especially the latter—has been placed in foreign hands. In view of the seriousness of matters in this connection it is interesting to consider the magnitude of the interests involved. The Dresdener Anzeiger has made a tabulation of statistics concerning the principal German yards, in which it is seen that these are 31 in number, covering a total of 12,139,740 square meters or about 3,000 acres. Of these 7,850,000 square meters or 1,940 acres are taken up by the Imperial ship works. The greatest of the private works, those of Schichau in Elbing, Danzig and Pillau, cover in all 212.5 acres. Next in order of area are those of the Vulkan Works in Stettin and Hamburg, with 126 acres, and Blohm & Voss in Hamburg with 113.6 acres. The next in importance are those of the Aktiengesellschaft Weser in Bremen with 99 acres, then the Bremer Vulkan Works in Vegesack, 74.1 acres; the Germania Werft of the Krupp concern in Gaarden near Kiel, 58 acres; Johann C. Tecklenborg in Geestemuende and the Nordseewerft in Emden, 49.4 acres; the Flensburger Schiffbaugesellschaft in Flensburg, 45 acres; the Howaldt Werke in Kiel, 32.9 acres; the Stettiner Oderwerke with 4.4 acres, and the Neptunwerke in Dostock with 26.1 acres. The other yards in Hamburg have a combined area of only 24.7 acres. Of these may be mentioned the Reiherstieg Schiffswerfe & Machinenfabrik with 12 acres; H. C. Stuelken Soehne with 4.4 acres; J. N. N. Wichhorse with 3.95 acres; H. Brandenburg, 3.4 acres, and Janssen & Schmielinsky, 0.22 acre.

Of ways there are in German ship yards 105 of 328 ft. long, 38 of lengths up to 492 ft., 19 up to 656 ft., and 15 over that length. Adding the five ways of the Imperial yards, there is a total of 182 berths for ships. Of 25, 21 are private and four governmental. The various yards have 73 docks, of which 16 dry docks are private. Five of these are less than 328 ft. long, the rest over that length. There are 34 private floating docks, of which 31 are less than 328 ft. long, 8 up to 492 ft. and 5 over this latter length. The greatest number of docks is owned by the firm of Blohm & Voss.

As regards workmen, the Imperial yards employ 23,000, the Vulkan yards 8,800, F. Schichau 7,100, Blohm & Voss 5,100, the Aktiengsellschaft Weser 4,230, the Germaniawerft in Kiel-Gaarden 3,500, Techlenborg in Geestemuende 2,620, the Howaldt Works 2,350, the Flensburger Schiffbaugesellschaft 1,500, the Reiher-Stieg-Schiffswerfte 1,410, the Bremer Vulkan 1,270, the Neptunwerft 1,290, and Seeback in Geestemuende (not mentioned in the previous part of the tabulation) 1,100. Of the Hamburg establishments just mentioned, H. Stuelcken & Soehne employ 450 men, H. Brandenburg 480, Wichhorst 280 and Janssen & Schmielinsky 210. In all, there are 63,430 persons employed in the German ship yards above enumerated.

Development of the Gas Engine

In the report for the year on the operations of Lloyds register of British and foreign shipping, just issued, an important statement appears under "Rules for Internal Combustion Engines." The use for internal combustion engines for marine purposes has hitherto been confined to small vessels and yachts, but now, says Lloyds, the possibility of the use of this description of engine as the motive power of large vessels is becoming a question of immediate and practical importance. The internal combustion engines in most general use on land and also those fitted in small vessels are worked on the four-stroke cycle principle, and are single-acting, so that with each cylinder there is only one impulse for two revolutions of the shaft. With this type of engine, there is considerable difficulty in effecting the reversal of the direction of rotation of the engine, and when these engines are used for marine purposes, the astern motion of the screw has usually been obtained by the use of toothed wheel gearing. Comparatively recently there has been a development in the Diesel oil engine for marine work. A two-stroke cycle has been successfully adopted, and the reversal is effected in the engine itself, the crank shaft being directly coupled to the screw shaft. The Diesel oil engine is now being fitted to three fairly large vessels being built on the continent under the supervision of the surveyors to Lloyds register. In a set of internal combustion engines which is being constructed under the society's survey in Britain for a vessel of about 260 tons, there are several novel features. The engines are intended to work with gas produced on board from anthracite coal. The cylinders are of comparatively small size, and the engines are intended to run at a high rate of revolution, and will not be reversible. The connection with the screw shaft will be made by means of a hydro-dynamic transformer in which a turbine pump driven by the engines delivers water to another turbine coupled directly to the screw shaft. The arrangement is such that the screw shaft will rotate at a much less rate of speed than the engines, and provision is also made for reversing its direction of rotation.

HOW THE MEYER SYSTEM OF NAVY YARD ORGANIZATION WORKS

Only a few examples are given of the inefficiency of the present organization. The writer has made a personal investigation and has himself seen these and many others even worse. It is well known that the navy department will punish any one who dares to speak the truth about the present organization. It has even gone so far as to punish prominent officials who, in the course of their duty, have given information to the naval committee. If the writer should tell all he knows, those innocent of any wrong would be marked for punishment. If congress will really investigate, abundant evidence to establish the charge of naval inefficiency will be forthcoming.

ALMOST a year has elapsed since the organization devised for the navy department by Secretary Meyer and his aides went into effect. The time has now arrived when it is possible to judge clearly the merits and demerits of Mr. Meyer's system of organization, to note its effect upon the efficiency and effectiveness of the navy and its value in procuring economy in naval administration. The author has recently had the opportunity of visiting several navy yards at some length, and of examining carefully and thoroughly their condition and administration under the Meyer regime. This article proposes to relate frankly the results of this investigation, showing the actual workings of the Meyer system as it affects the navy yards. The author is an engineer by training and experience and is competent to criticize engineering matters and affairs pertaining to works management.

At the time the Meyer "re-organization" took effect, it was announced that the new scheme would promote harmony, simplicity, efficiency and the utmost economy. It was announced that the Newberry system of consolidation had failed in all these particulars. As a matter of fact, in the few yards where the Newberry system had full swing and during the very short time it was in operation, some startling results were obtained in the reduction of the cost of doing work. How has the Meyer scheme fared in this respect?

Meyer System Results in Friction.

After a careful study of the situation the author has come to the conclusion that the Meyer system of naval organization has resulted in friction, wastefulness, extravagance, useless duplication of machines, materials and organizations, conflict of authority and dangerous division of responsibility. The system is without a counterpart in any industrial organization; it is clumsy, crude, illogical and unbusinesslike. These contentions the author will prove in the course of this article.

Friction between officers, between departments and between superiors and their subordinates has developed—in some cases to an alarming degree—because the officers who actually know the *least* about yard administration and the extremely technical matters constantly arising for consideration and adjustment, are placed in authority over the officers who really know the most about these matters. The supreme authority is rested in line officers whose experience has been almost entirely at sea, and who know nothing of shops, engineering, organization or works management, while the construction officers, whose training specially fits them for yard management, are placed in subordinate positions. This is a reversal of the natural order of things, and places the commandant in a false position. Friction is only the natural result, and friction has developed, as might have been expected, to the great detriment of the efficiency of the service. It has been urged that the commandant of a navy yard occupies a position comparable with that of president in a commercial organization and that technical skill on his part is therefore unnecessary. This might be all right if it were true, but in actual practice the commandant under the Meyer scheme is the actual manager of the yard and all the technical details pass through his hands. With this in mind, the folly of placing a line officer in this position is self evident. The subordinant officers are allowed practically no freedom of action, which only increases the friction all along the line; the ropes are drawn so tightly that no communications are permitted between heads of departments without going through the commandant's office. Frequently the written orders of a superior are revoked to his subordinate verbally, after the superior learns how little he himself knows about the matter.

Sample of Idiotic Orders.

Below are samples of the idiotic orders which emanate from the headquarters of the department at Washington. A navy yard was requested recently to furnish "a payroll of indirect charges." The entire cost system in vogue in the various yards was recently suddenly and radically changed by a letter from Washington. A few days later a new order was received, only to be immediately modified by telegraph. In five weeks five important modifications were made in the cost keeping system. Owing to the divided responsibility and lack of ability in many directions, the writer found that in some yards under present circumstances, one division or department would be up to date in its work and another all the way from one to three months behind.

Waste, extravagance, useless duplication, conflict of authority and division of responsibility are only a natural result of the system now in vogue. The Newberry system was unified, compact and concentrated; the actual workings of the Meyer system show it to be scattered, inharmonious and hardly worthy of the names of organization. Instead of one organization with centralized, intelligent authority, each navy yard consists nominally of three great departments, a hull division, a machinery division and a department of yards and docks. The line of demarcation between these departments can be only vaguely defined; the departments are at once independent in authority and inter-dependent in their work. These are the two great, irremediable faults which are inherent in the system itself, and which can be eliminated only by eradicating the entire organization root and branch. The following incidents illustrate a few of the follies growing out of this system of having several independent departments working on the same job.

Interminable Red Tape.

The hull division needed the use of a locomotive crane alongside a ship at dock. Permission to use the crane had to be formally asked in writing of the bureau of yards and docks, and it developed that the crane was broken and in need of repairs. The bureau of yards and docks had made no effort to have the crane repaired of its own initiative so that it might be ready. The civil engineer was called in to inspect the crane and report to the captain of the yard, head of the department of yards and docks, its condition. He reported certain minor repairs necessary requiring some machine shop work. A formal order to

do the work was then presented to the machinery division. When the machine work was done it was presented to the civil engineer, who in his turn reassembled the machinery and reported again to the captain of the yard in writing. Finally, the crane was ready at the end of ten days, and one day had been necessary for the actual work of repairing. Meanwhile the ship needing the services of the crane, waited.

To obtain permission to work at night on a rush job in dry dock, it is necessary to first get the written authority of the commandant and to then write three letters to each of the three departments concerned.

The essentials of the Meyer system are embodied in an official circular called "Changes in Navy Regulation No. 6," dated at Washington, Nov. 18, 1909. Below is paragraph No. 1566 of this circular, which indicates very clearly the duplication of facilities and also the fact that the machinery division is made self-contained, whereas the hull division is dependent upon the machinery division for assistance in executing 40 per cent of its work. The duplicated facilities are in italics.

"1566. (1) At navy yards other than at Washington, there shall be two divisions of the manufacturing department—the machinery division and the hull division; and all labor in the navy yard, except that of the medical department, of the general storekeeper, and of the provisions and clothing depot, shall be distributed between these two divisions as the commandant may direct.

"(2) The shops and manufacturing and repairing facilities at a navy yard, except those for the preparation or manufacture of provisions or clothing, shall be assigned to the machinery and hull division, as follows:

"Machinery Division.

Blacksmiths' shop (machine).
Boiler shop.
Coppersmiths' shop.
Machine shop.,
Pipefitters' shop.
Tool makers' shop.
Instrument makers' shop.
Electrical shop.
Foundry.
Pattern shop.
Anchor shop.
Chain shop.
Power station and plants.
Boiler plants and sub-stations.
Operating machinery of mechanical coaling plants.

Hull Division.

Sawmill.
Shipwrights' shop.
Spar shop.
Boat shop.
Mold loft.
Block shop.
Carpenters' and joiners' shop.
Upholstering and leather working shop.
Blacksmiths' shop (hull).
Plumbers' shop.
Pipefitters' shop.
Galvanizing and electroplating shop."

In one yard the writer saw quantities of light sheet metal work being done in a *boiler shop* with a nearby sheet metal shop working at half capacity. Upon inquiring the reason it was found that the two shops belonged to different divisions and did not cooperate. Another shop went to considerable expense in procuring and preparing material for an important job, and then discovered after a few hundred dollars had been spent, that there was no tool large enough to work the material. At another point four men were seen laboriously dragging heavy pillow block caps about by main strength, while two cranes lay idle within 100 ft. But the cranes belonged to another department, and to get permission to use them would take a day's time.

Central tool grinding stations, systematic routing of work through the machine shops, and other money and time-saving features found in every even moderately well-appointed commercial shop today, cannot exist at the navy yards under the Meyer system.

Men Loitering About the Shops.

Another feature in the Meyer system productive of waste is the fact that the sailors aboard ship are supposed to co-operate with the yard in making certain minor repairs, the result being that enlisted men are continually loitering about the shops, interfering with the work, borrowing tools and taking up the time of workmen and foremen.

If a pipefitter in the hull department wants a pipe cut for a certain purpose, or special threads cut requiring machine work, it is necessary for the construction officer to write a letter about the matter to the head of the machinery division, who in turn issues the order to his shop foreman. The actual work to be done might not take over 10 minutes.

In some cases where a worm gear is used, one department is responsible for the worm and another department for the wheel, while neither is obligated to see that the two parts are a mutual fit. Yet this is one machine paid for by one appropriation. Such is the Meyer organization!

Examples of Divided Responsibility.

A few more examples of the division of responsibility between the hull and machinery departments are of interest. In a torpedo outfit the hull division builds the foundations and installs the mouthpieces and sluice gates for the tubes; the machinery division places the tubes, which are then drilled and secured by the hull division. The machinery division installs the motors, controllers and pinions on motor shafts in boat cranes, while the rest of the work goes to the hull division. In the case of deck winches, the hull division builds the foundations and drills holes and then the winches are provided, lined up, placed and secured by the machinery division. The same is true of anchor winches. Devices for filling fuel oil tanks are fitted by the hull division; indicators for the tanks are provided by the machinery division, but are installed, except electrical connections, by the hull division. The machinery division provides the steering engine, places, couples and secures it, the balance of the work connected with its installation being assigned to the hull division. The hull division is responsible for the fresh water system on a ship, except that power pumps are provided, placed and secured by the machinery division. In the case of ventilating, refrigerating or heating apparatus, the hull division builds the foundations for fans and builds all trunks and ducts; the hull division also installs all piping for steam heating outside of the engine and boiler rooms; in the engine and boiler rooms this same piping is installed by the machinery division, which also provides and installs fans, motors and controllers and all refrigerating machinery, including piping up to the cold storage rooms. Piping in the cold storage rooms, however, is installed by the hull division. It will be remembered that the hull and machinery divisions are independent, co-ordinate departments and that neither is answerable to the other. A better device to divide responsibility, delay work, create expense and introduce errors could not have been invented than this system devised by Mr. Meyer to apportion naval repairs between the two great departments into which he has divided our navy yards.

Arbitrarily Dividing Work.

When a ship comes to a yard for routine repairs, the captain makes a report to the commandant of the yard, giving a list of the repairs desired. Then the work is parceled out between the hull and machinery division, leaving, of course, a few gaps to be filled later. The two departments concerned then independently commence work. While this red tape is unwinding the ship lies waiting, probably eight or 10 days. The hull division usually does 60 per cent of the work, 40 per cent of which requires

machine work, and in order to get this machine work done, formal request must be made to the machinery division for each item. The folly of thus arbitrarily dividing work which is naturally a unit, between two artificial hull and machinery departments would be apparent to anyone but a naval officer.

Instances of this useless division of responsibility might be continued indefinitely. A few more only, however, will be cited. In installing a pipe line carrying steam for cookers in the galley, the pipe is laid by the hull division and the valves in the same line by the machinery division. The "Changes in Naval Regulations," referred to above, state in one place: "The Bureau of Ordnance shall design, construct and determine the requirements of all ammunition hoists," and in another place, "The Bureau of Construction shall have cognizance of all electric turret-turning machinery and of all electrically-operated ammunition hoists *except* turret hoists." This is a fair sample of the consistency of naval regulations and of the indefinite mass of conflicting regulations upon which the Meyer system is founded.

In order to further mix matters, the captain of the yard, who has a large amount of work to do, keeps no labor roll, but draws his men as he wishes from the machinery or hull departments and turns them back to these departments when he is through with them. The confusion, waste and trouble this arrangement causes may be easily imagined.

A Plethora of Officers.

Of course, all this duplication of facilities and division of responsibility requires more officers. *Twenty-two additional officers* were recently ordered to duty at one prominent yard, adding to the payroll chargeable to this yard over $75,000 per year without one whit more work being done. Meanwhile constant requests are made to congress for more officers for the fleet.

The Meyer system is gradually breaking down of its own weight. Probably its worst feature is that all incentive to economy, achievement and progress has been completely crushed out of the ambitious officers and workmen. There is no system or order prevailing, and nothing left to strive for; all efforts toward progress are promptly crushed. Even numberless line officers for whose sole benefit the Meyer system was established, have become disgusted. One who was sent to a navy yard could not stand it, and asked to be again sent to sea. Another line officer after several weeks on duty at a navy yard, asserts he is ready to submit a written report that the present system is a failure, and can never be made to work. It appears that the Meyer organization is so crude that it has over-reached itself, so that even its friends and those whom it was designed to benefit are turning against it.

There is on file in this office a letter from a naval officer, in which he says:

"The explosion on the North Dakota is what one expects under the present condition. I know of but one accident on an oil burner, and that was when the ship was under repair, and was due to a rotten installation in an old ship and the oil leaked all over the ship. I think that it was on the Dispatch in San Francisco. In the North Dakota every precaution was taken in the installation—far more so than on a merchant ship, and it should be almost fool proof. As you know there is no danger of oil under ordinary working conditions, but if we are to have line officers as engineers we can expect anything. *Mark my words,* We shall some day and perhaps soon, have some accidents that will startle the world. I see by the papers that engineering conditions on the battleship Indiana are rotten, and that a court martial of the engineer officer will result. They can't convict anybody. It is the Navy way. No one is responsible."

The Newberry Naval Reorganization Plan

EDITOR MARINE REVIEW:—Sir: To Mr. Truman H. Newberry must be given the credit for initiating reform in our naval establishments on shore. Doubtless he would have achieved wonderful results in economy and efficiency had he been permitted to remain as secretary of the navy, for he brought to his task wide experience as a manufacturer, intimate knowledge of naval matters and naval men, based upon an exceptionally long term of service in the navy department, and unusual moral courage. His predecessors had written long and elaborate reports on the need of change in both organization and administration which were *brutum fulmen,* but he, knowing exactly what to do, proceeded to act. His successor found this important question raised so definitely that but two courses were open to him—either to return things to their former condition or to push ahead along the path Mr. Newberry had blazed. He chose the latter. Unfortunately he was not content with giving Mr. Newberry's scheme a fair trial but almost immediately proceeded to make important departures without possessing personal acquaintance with the intricate naval organism. It may safely be asserted that without Mr. Newberry's forceful and self-reliant action naval reform would have continued a subject of discussion as something desirable but impracticable of attainment and that pretty much all of good which Mr. Meyer will achieve will be due to the preparation of the field by Mr. Newberry.

Modifications of the Plan.

It may serve a useful purpose to contrast the plan as originally laid out and as it now exists after modification. In one respect no difference is to be perceived. The bureau of equipment is eliminated by both. Whether it is a wise move or not is far from settlement. It would indeed seem preferable, from the seagoing officers' standpoint, to recognize the unavoidable distinction between the four principal departments represented by the building of the hull and its fittings, the building of the engines, etc., the construction and mounting of the battery and the providing of the innumerable articles of equipment, without which a ship is helpless. To burden the great manufacturing branches with the furnishing of corn brooms, holystones, awnings, bedsteads, mattresses, cooking utensils, hawsers, etc., is, some competent critics believe, a mistake. However, the thing has been done and the future will alone show that it was judiciously done.

This ultimate abolition of the bureau of equipment was practically the only fundamental change in the navy department itself contemplated by Mr. Newberry. He altered in some ways the existing machinery as, for instance, in a recomposition of the board of construction, giving it an overwhelming majority of line officers, appreciating, as he did, the necessity of fresh and interested representation from the fleet and in taking steps to get up an accounting

system by which accurate returns could be had of the actual cost of work. He perceived that the navy yard is merely a hand maiden to the battle ship and he believed that rapidity and economy of work could best be secured through placing all manufacture there under one superintendent acting by orders of the commandant. At one stroke he abolished five independent plants at a yard, each in some cases maintaining a full equipment of similar general shops, besides the possible one or two peculiar to its own needs and he concentrated them all in one as the charge of the manager of the manufacturing department. This was a fatal blow to the pernicious extension of the so called "Bureau System." The business of the navy department, as will be remembered, is by law divided among eight bureaus with only five of which he was concerned in this instance, viz.: construction and repair; steam engineering; ordnance; equipment; yards and docks, for these were the bureaus which, from small beginnings, had gradually built up separate industrial establishments at each yard, covering much the same ground. The consequent multiplication of tools and administrative staff was both wasteful and indefensible, and at Mr. Newberry's command, its unholy career came to an end.

Newberry's Division of the Manufacturing Department.

Mr. Meyer has divided the manufacturing department at the yards into two great divisions, hull and engines. Much may be said in favor of this measure, although it will never be possible to compare the actual working of the Newberry and the Meyer plans because the former was denied an opportunity to demonstrate its value. It offered one apparent advantage not possessed by the latter. Through continuity of employment the naval constructors, a shore-keeping set of officers, from among whom all managers of the manufacturing departments were drawn, would probably have become, eventually, fairly good shop managers. The sea-going officer, now head of the engine division for a relatively brief term of service, lacks the opportunity and may possibly fail therefore to reach the highest plane of efficiency. The cost accounting ought to determine this difference and, incidentally, set up a healthy rivalry between the hull and the engine divisions.

This move on Mr. Meyer's part is based on the assumed analogy between private ship yards and navy yards. It ignores the fact that, in the former, the central control is located in the yard itself and it re-establishes that of the bureaus, destroyed by Mr. Newberry. In the one case the main office is close at hand to supervise and direct both branches, making them work together for the common good, in the other the actual chiefs are remotely placed in Washington. Time alone will show the wisdom of this departure from Mr. Newberry's plan.

Mr. Meyer has also reinvested the management of its affairs at the yards in the bureau of yards and docks (civil engineering). Since the civil engineers had exhibited an almost unbroken record of extravagance and inefficiency, the justification for this move is less apparent.

A Probably Fruitful Change.

In the department itself, Mr. Meyer has made one radical change which promises to be fruitful of benefit. He has formed four great divisions, operation (of the fleet), material, personnel, and inspection. At the head of each is an aide, a naval officer of his selection whose province is to keep the secretary informed on subjects pertinent to his division and to recommend appropriate action when necessary. The division of operation concerns the employment of vessels, war plans, qualities and attributes of ships to be built and the general direction of the squadrons in time of war. It includes the war college, the general board and the office of naval intelligence. That of material embraces the bureaus of construction and repair, steam engineering, ordnance, supplies, and accounts. That of personnel takes in the bureaus of navigation and the medicine and surgery. That of inspection corresponds to the inspector general's place in the army. It fills a long-felt want as the essence of efficient administration is frequent and unexpected scrutiny. While opinions may differ as to whether the advantages to be derived from, say, the bringing together of the four manufacturing and providing bureaus under one control may not be outweighed by the inevitable delay and red tape it occasions, no one can justly challenge the desirability of a remorseless inspecting board empowered to inquire into anything and everything. As to the former an earnest effort to push the work along and not to consume time in needless references and cross references may succeed in removing the doubts that still exist in certain quarters, but if the labors of the division of material are undertaken in any other spirit, notably in a desire to magnify the office at the expense of accumulating papers and hampering the legitimate activities of the bureaus within it, ultimate breakdown is inevitable. Therein lies the danger which only broad-minded action combining force and prudence can avail to escape.

You will, of course, perceive that the time is inopportune for a disclosure of the writer's identity and I therefore beg to subscribe myself,

Very respectfully,

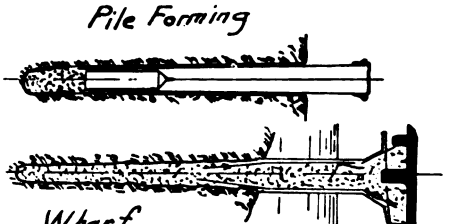
CONNING TOWER.

A New Concrete Pile

BY J. M. WRIGHT.

Improvements in the various types of concrete piles, and their accompanying driving and casting apparatus, have been noted from time to time. Many cities of the United States are now requiring that concrete wharves be built to replace the old wooden ones that are fast going into disuse. The combined efforts of the physical, animal and vegetable world have no effect upon concrete construction, and it is well to note the great advances in concrete appliances peculiar to water-front uses.

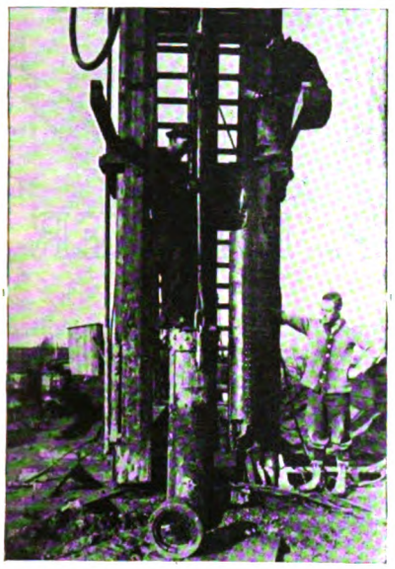
With the old wooden pile and the



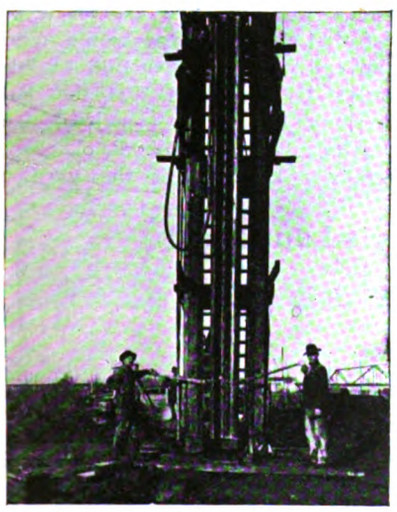
"ready made" concrete pile the problem has been largely one of getting a bearing on bed rock, and using the foot of the pile and its supporting substance to uphold the entire load. With the advent of the concrete pile "cast in place" the problem has become one of securing an intimate relation between the wet concrete and the surrounding earth, so that the concrete after hardening may become as nearly as possible a part of the earth itself. This is desirable in that it decreases the load to be borne by the earth immediately at the foot of the pile, and increases the skin "friction," thereby distributing the load along the entire length of the pile. If the pile has a tapering body there is an added advantage on account of the in-

creased support given the pile throughout its entire length.

There is a third advantage in casting the pile in place. With both wooden and "ready made" concrete piles there remained considerable material above the ground to be removed after the pile had been driven to its entire depth. The removal of this material was expensive from the standpoint of wasted material, labor involved and loss of time. This expense has been done away with by simply stopping the formation of the pile when the proper grade has been reached.



DEPOSITING BUCKET, JUST RAISED FROM BOTTOM OF SHELL.



SHELL OPEN AND CORE REMOVED.

An improved type of concrete pile and "former" has been designed by the Portland Concrete Pile & Equipment Co., of Portland, Ore., and is shown in the accompanying figures. The "former" consists of a structural steel core incased in two semi-circular steel shells hinged together on their side, and having an opening on the opposite side, covered by a closure plate.

The pile former is driven into the earth by a steam hammer, or other method of pile driving, to a depth to conform with the architect's plans and specifications. The core is withdrawn as the hammer is hoisted, being directly secured to the hammer. After being raised sufficiently to clear the "former" a quantity of wet concrete is deposited in the shell by means of a bottom dump bucket. The shell is then withdrawn for a short distance and the concrete thoroughly rammed into the surrounding earth. A second bucket of concrete is introduced, the shell is drawn a short distance and the concrete is again rammed. This operation is repeated until the shell is entirely withdrawn and the pile is completed.

The earth surrounding each pile has been compressed by the driving of the tapering former. As the concrete has been thoroughly rammed, this pile cements itself to the surrounding earth, increasing the skin friction to a maximum and distributing the load along the entire length of the pile.

As described in THE MARINE REVIEW of July, 1910, San Francisco has made the first step on the Pacific coast toward permanent wharf construction in the completion of the concrete piers 38 and 40 at the foot of First street. Other cities on the Pacific coast are now considering the erection of concrete piers. First among these is Portland, Ore., where tentative plans have been drawn for a number of permanent concrete wharves under the direction of the port of Portland.

Pacific Coast News

THE first submarine signal bells to be installed on coastwise merchant vessels were tried out recently on the steamship President, of the Pacific Coast Steamship Co., under the command of Capt. H. C. Thomas. Capt. Thomas states he was able to catch the signals from Umitalla reef at a distance of about seven miles. The government, some time since, equipped a number of lightships and signal stations with submarine bells, but the merchant vessels are just realizing their value. The submarine bell will do much to prevent the numerous casualties on Puget Sound due to fog and silent zones.

The Marine and Fisheries department of the Dominion of Canada has announced the following aids to navigation that will be established in British Columbia waters: Gas beacon on Mary Ann Point, Active Pass; gas beacon for Camp Point or Helmcken Island, Johnson Strait; acetylene light on 13-foot rock off Crane Islands; white beacon on point of Denny Island, opposite Serpent Point, Lama Passage; gas beacon and bell on Camp Island, Lama Passage; beacon on north extreme of White Cliff Island, Arthur Passage; lighthouse and fog signal marking Holland Island, outside Prince Rupert harbor; beacon and bell buoy at Spire ledge, Prince Rupert harbor; gas beacon on Low Islands, at entrance to Selwyn inlet, Queen Charlotte Islands.

Capt. T. H. Alcock, who was appointed master at Prince Rupert harbor on that port being proclaimed a public harbor, has taken up his work. The limits defined for the northern harbor include all waters east of a line drawn from Ryan Point to Enfield Rock, thence south to Kinahan Islands and then southeast to Lulu Island.

Capt. Emil Francke, superintendent of the Pacific Coast Steamship Co., one of the most experienced shipping men on Puget Sound, has resigned. E. L. McNoble, chief stevedore, at San Francisco, has been appointed to succeed Capt. Francke at Seattle. Mr. Noble is well known, having been for years pilot and master for the California Transportation Co., and recently assistant to Capt. I. N. Hibberd, the San Francisco superintendent.

The steamer Princess Adelaide, built for the Canadian Pacific Railway Co., for service between Vancouver and Victoria, B. C., will arrive on Puget Sound about the first of December. She was built at the Fairfield Shipbuilding & Engineering Co., on the Clyde, and is being brought out by way of Vincent, Montevideo and Coronel. On her trial trip she made 18.25 knots, the contract speed being 17 knots. She is a single-screw steamer, 290 ft. long, 46-ft. beam, and 17 ft. deep, built of steel throughout with cellular double bottom and seven transverse bulkheads. The steamer is fitted with 118 staterooms, and will have a grill room and restaurant in addition to the regular dining room. The social halls are finished in mahogany and the dining room in walnut. The propelling engine is of triple expansion type, developing about 4,000 horsepower. Steam is supplied with four boilers, each 15 ft. 3 in. diameter and 12 ft. long, equipped with Howden's

forced draft and built to carry 180 lbs. steam pressure.

The fast steamer H. B. Kennedy, built by the Willamette Iron & Steel Works, Portland, and operated by the Puget Sound Navigation Co. between Seattle and Bremerton, Wash., recently made a remarkable speed run over the government measured mile.

With one of her two boilers in use, the Kennedy is reported to have made 15.88 knots per hour and with two boilers 17.5 knots. On an unofficial trial several weeks ago the Kennedy is said to have made 20.83 miles with 300 people on board. The Kennedy is equipped with Ballin water tube boilers, built by the Ballin Water Tube Boiler Co., Portland, Ore.

The H. B. Kennedy is said to be the fastest passenger steamer on Puget Sound. The Puget Sound Navigation Co. will soon let contract for a fast day steamer to operate between Seattle and Tacoma. The new steamer will be over 200 ft. long and will have a sustained sea speed of 18 knots. The city of Tacoma will vote on the authorization of a new municipal dock on Oct. 29, and the Puget Sound Navigation Co. agrees to have the new steamer in operation within seven months after the city authorizes the dock.

The Princess May, which was recently saved from Sentinel Island, Alaska, where she was wrecked, is being fitted to use oil fuel while being repaired by the British Columbia Marine Railway Co., Victoria, B. C. At the present low price of oil on the Pacific coast, it is estimated that the saving effected by the use of oil is from 40 to 60 per cent.

LAUNCHING THE WILLIAM P. PALMER

THE bulk freighter William P. Palmer, the first steamer to be built on the Isherwood or longitudinal system on the great lakes, was successfully launched at the Ecorse yard of the Great Lakes Engineering Works on Oct. 15. This steamer is building for the Pittsburg Steamship Co., and is named in honor of William P. Palmer, president of the American Steel & Wire Co. She was christened by Mr. Palmer's six-year old daughter, Jane, one of the youngest sponsors that ever christened a ship on the lakes. The launching was witnessed by about 1,000 persons who were taken to the ship yard on the steamer Promise.

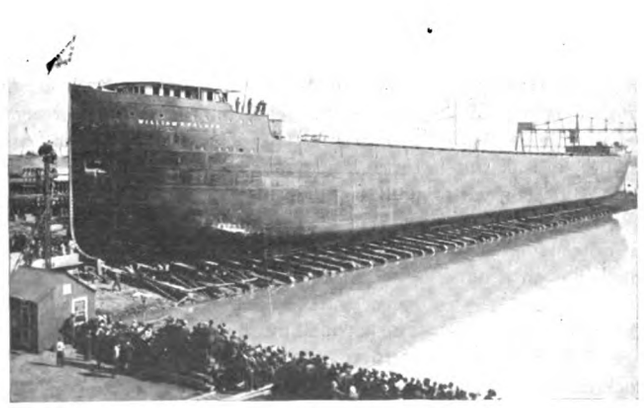
The event obviously attracted more than usual attention among vessel owners and architects and the opinion among them was practically unanimous that a better built ship does not exist on the lakes. In fact, at the luncheon at the Hotel Pontchartrain which was tendered to the guests by the ship building company after the launching, Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., stated that she was the finest ship in his judgment that had ever been built on the lakes, that he had gone over her in great detail and that he had never seen better workmanship. He added that the Palmer represented a new type of construction on the lakes and he hoped that all expectations would be realized. He also expressed the great personal pleasure he felt in naming the ship after Mr. Palmer.

MISS JANE PALMER, THE SPONSOR.

Mr. Palmer in replying said that he was deeply sensible of the honor of having such a splendid steamer named after him.

President Pessano of the Great Lakes Engineering Works expressed his gratification at the smooth way in which everything had worked at the yard, was immensely pleased at the compliments which had been showered upon the ship, and expressed his belief that the new type would mark an advent in the construction of lake vessels. He predicted that the Palmer would carry a greater load than her sister ship, the W. B. Dickson, which was launched at the yard in

Remarkable Photographic Record of the Palmer's Launching



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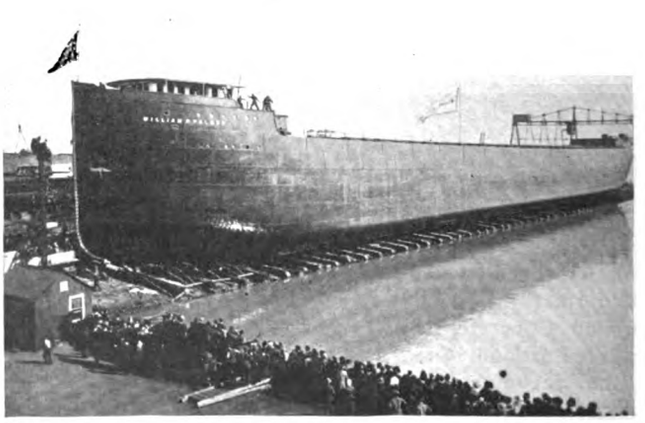

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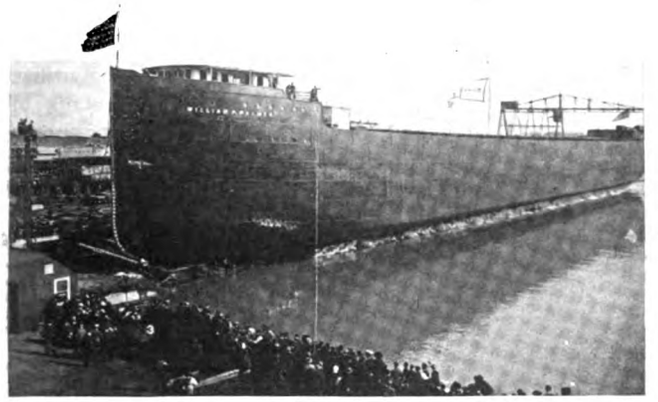

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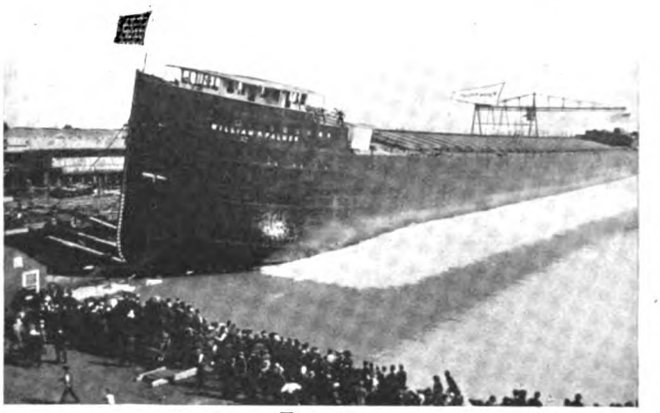

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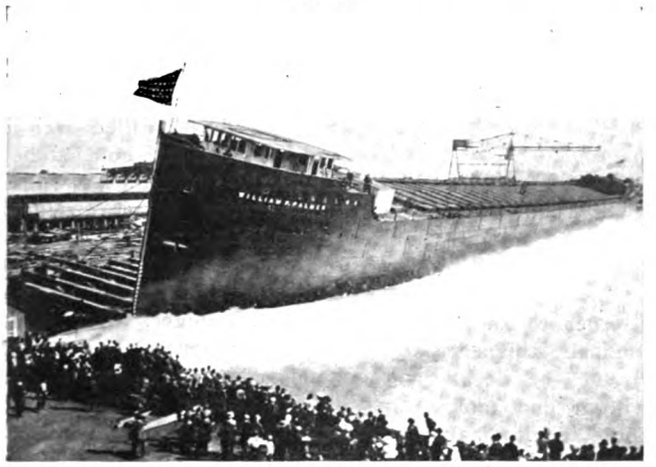

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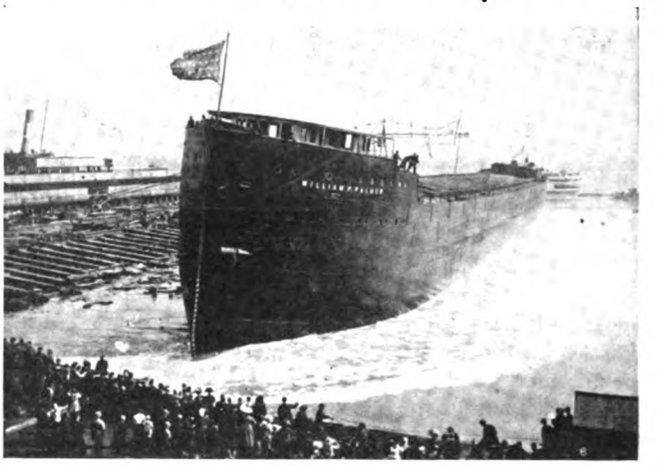

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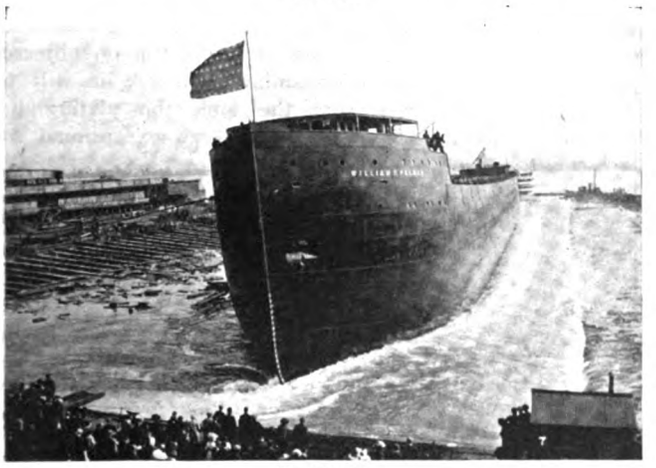

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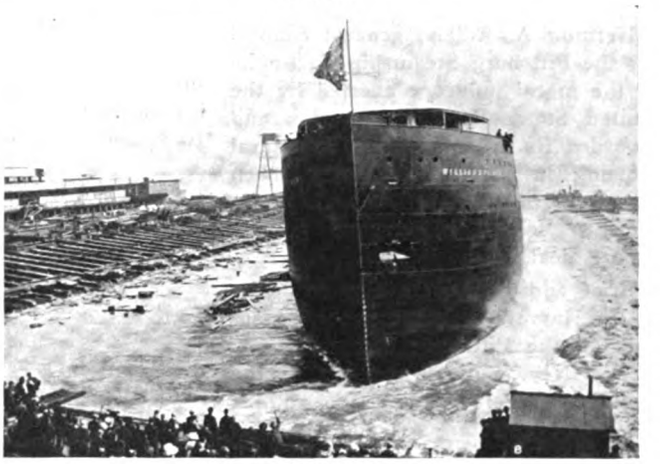

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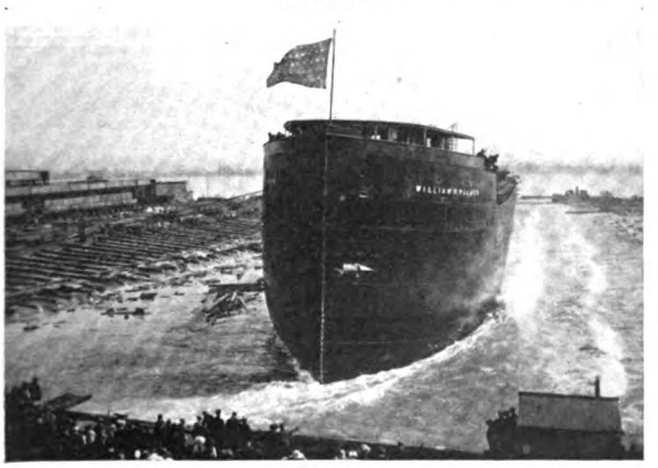

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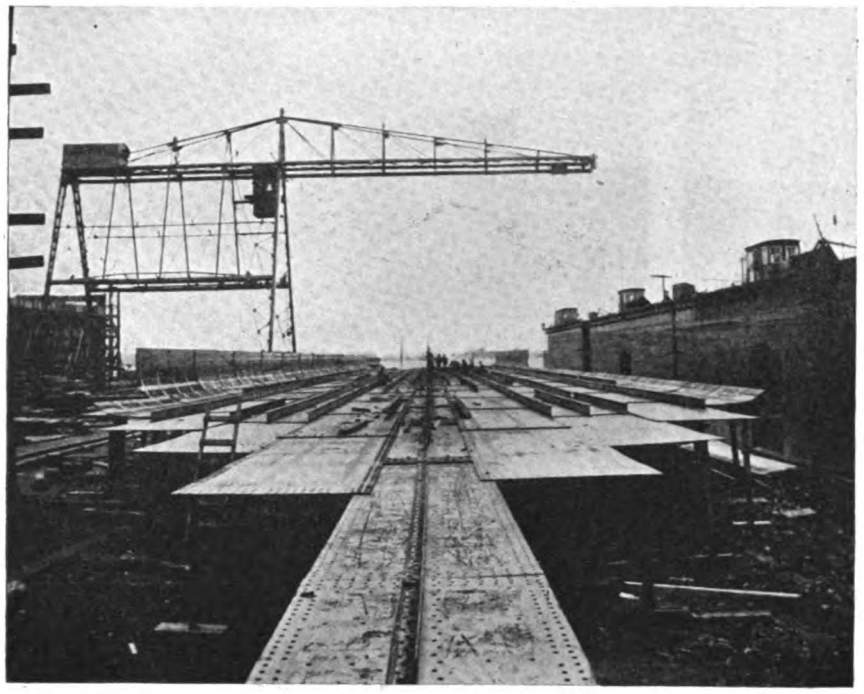


LOOKING FORWARD, MAY 28.

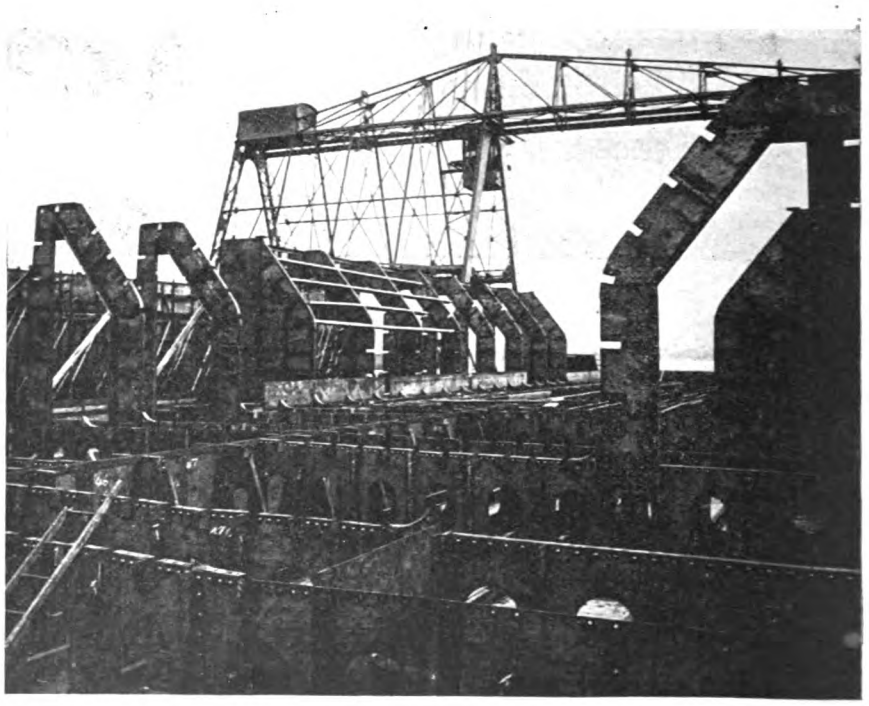
August. In fact, the latest report from the yard was that with machinery and all other weights aboard, the displacement of the Palmer is 500 tons less than that of the Dickson, which would of course indicate that she should carry 500 tons more cargo.

Hermon A. Kelley, general counsel for the Pittsburg Steamship Co., spoke of the moral influence exerted by the United States Steel Corporation and regarded its organization as a natural blessing in that it has never taken advantage of a competitor and is anxious to see that everyone gets a square deal.

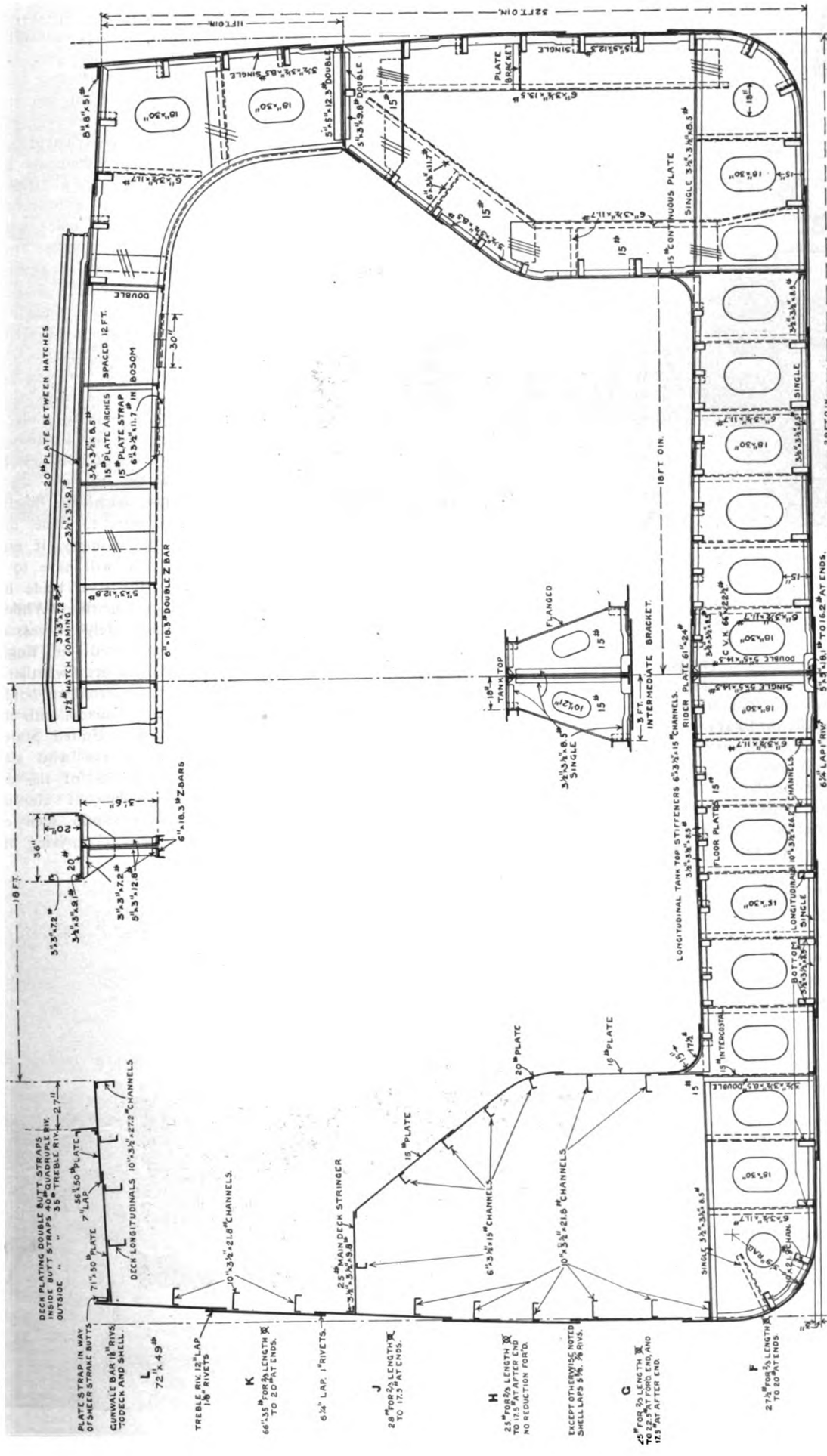
Brief addresses were also made by A. F. Harvey, assistant general manager of the Pittsburg Steamship Co., R. W. Ney, general manager of the American Steel & Wire Co., and A. T. Allen, secretary of the Steel & Wire Co.

The Palmer is 600 ft. over all, 580 ft. keel, 58 ft. beam and 32 ft. deep. In the Isherwood system of construction it may be stated that the transverse frames and beams are fitted at widely-spaced intervals, the general practice, so far, having established this at about 12 ft. These structures form complete transverse belts around the ship. They are directly riveted to the shell plating and deck of the vessel, and are made of not less strength than the number of transverse frames that are fitted in ordinary vessels for a corresponding length of ship. These strong transverse girder frames are slotted around their outer edges, in order to admit of continuous longitudinal stiffeners being fitted, not only at the decks but on the sides, bottom and tank top. The fitting of these longitudinal stiffeners directly on to the plating prevents damage to the decks through buckling, an advantage over vessels of the ordinary type which have had no direct fore and aft support to the plating in between the transverse beams. In vessels with double bottoms, transverse floor plates are fitted intermediate to those at the sides and decks of the vessel. These intermediates enable sectional materials, such as bulb angles or channels being utilized as longitudinals, both at the tank top and on the outside plating, thereby providing a double bottom construction, which is much more ready of access than one built on the ordinary system.

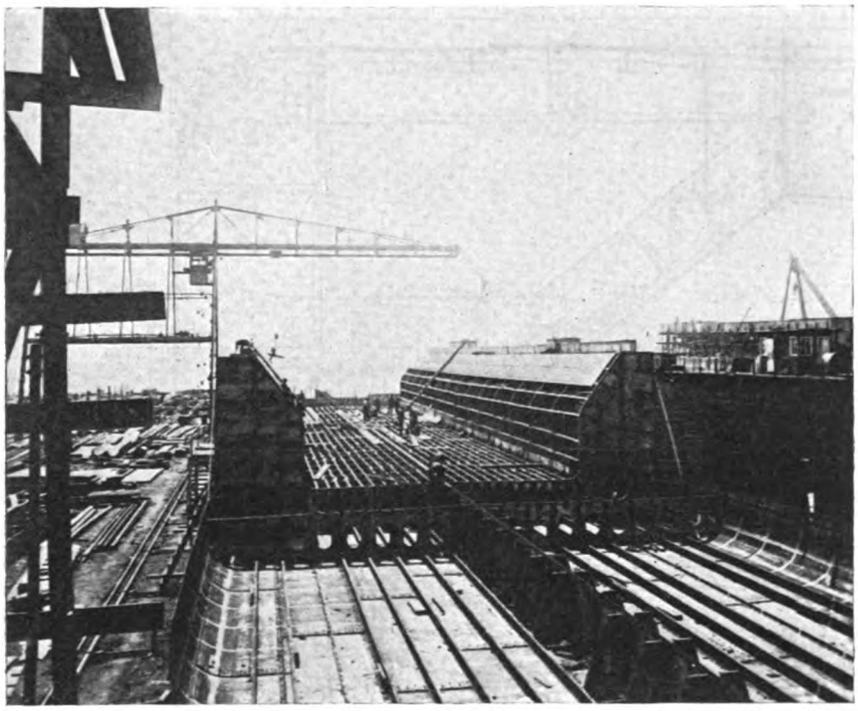
It is claimed for the system that it affords a better distribution of metal, making a lighter and stronger ship, and in fact it is predicted that it will eventually supercede the transverse type on the lakes. The saving in weight of material is effected by dispensing with beam knees, a number of bilge brackets, tank knees, packing and many transverse connections. As in all steamers of the so-called arch or deep-beam construction, hold stanchions are entirely omitted. As will be seen by reference to the midship section, the Palmer is of the now well-known hopper type with side tanks extending to the height of the main deck stringer. Her transverse girders are spaced 12 ft. apart and extend completely around the ship. In the bottom of the Palmer an intermediate transverse floor plate is fitted, thus giving a spacing of transverses, in the double bottom of 6 ft. In order to withstand the very rough usage the tank top is subjected to in unloading iron ore it will be seen that the tank top plating has stiffeners fitted of an exceptional na-



LOOKING FORWARD, JUNE 4, SHOWING TRANSVERSES AND FIRST SECTIONS OF SIDE TANKS.



MIDSHIP SECTION OF THE BULK FREIGHTER, WILLIAM P. PALMER.



LOOKING FORWARD, JUNE 19.

ture and the tank top plating is of very substantial thickness, namely 24 lb. It is claimed that the longitudinal strength of this vessel particularly as regards the bottom of the structure, is in excess of that of similar vessels built on the ordinary type of construction. This is considered an advantage in the type of ship with machinery weights in the extreme after end. The Palmer is being built to the Lloyds register and under the direct supervision of James French, Lloyds surveyor for the great lakes, with headquarters in Cleveland.

Work upon the Palmer has been rushed since the launching and were it not for the fact that the season is ending so abruptly would probably make a trip this fall. Her cabin accommodations are very elaborate and she will undoubtedly do her share in entertaining the guests of the United States Steel Corporation.

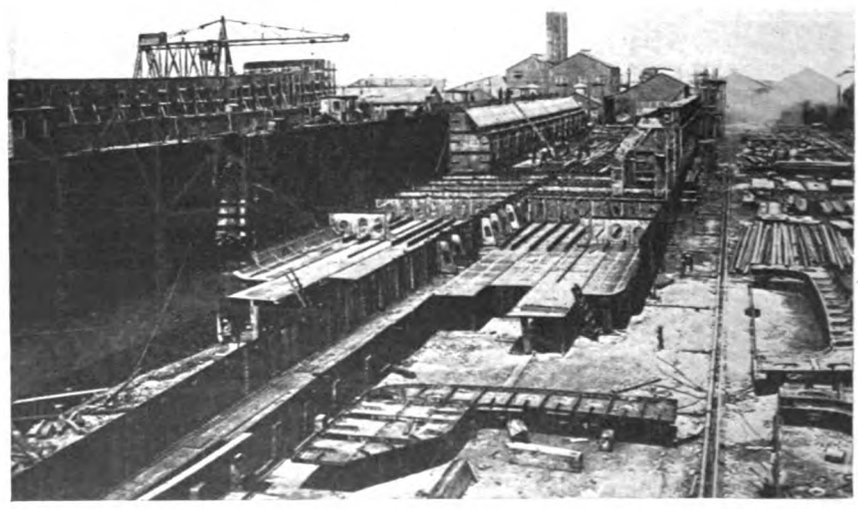
Canada's New Navy

Sir Robert W. Parks has returned to England after a two months' visit to Canada, where he has been engaged in connection with the proposed dry dock at Quebec and the Georgian Bay canal from the great lakes to the St. Lawrence. He has since his return given his opinion anent the progress which the Canadian government is making with the scheme for the construction of the Canadian navy, that the only practical basis upon which British ship constructors could work in Canada, and especially undertake the construction of the Canadian navy, would be by securing from the government a very substantial bounty upon ship building in the dominion. "It is absolutely certain," he says, "that no ship building could be profitably conducted on the maritime coasts of Canada in competition with the British ship building yards."

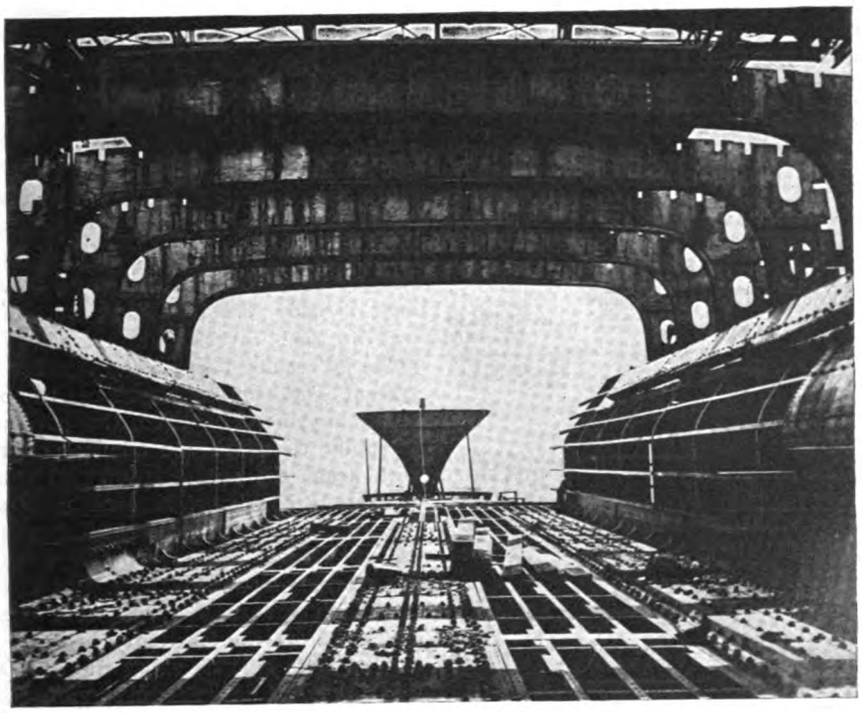
The Canadian government has made it a condition that the new navy should be built in Canada, but that none of the ships should be constructed at any of the lake ports. It seemed therefore certain that either the port of Halifax or St. John will be selected as the naval base and the center of the new industry, if established under the protection of the dominion government. The ports of St. John and Sydney are of course rivals in this matter to Halifax, and probably the British government, the admiralty and the war office will be entitled to be consulted before any definite decision of the Canadian government is taken as to the selection of the port on the Atlantic seaboard for the new naval station. Whatever site is selected, Sir Robert Perks thinks it is certain that no yards for naval purposes could be profitably established unless the future commercial ship building trade of Canada is taken into consideration.

On the question of bounties, Sir Robert Perks further says:

"This unquestionably is likely to be very large in years to come, but in its early stages the industry, if established at all in Canada, will have to be nurtured just as the steel trade has been by a system of bounties. While such a system is absolutely necessary and would be reprobated in England by thoughtful economists, whether taking the shape of government bounties or protection, yet in Canada, with the fierce competition of the United States, it is quite clear to people who study the commercial conditions of the dominion today, that a policy of absolute free trade to Canada would spell complete ruin to multitudes of thriving manufac-



LOOKING AFT, JUNE 19.



LOOKING AFT, JULY 23, SHOWING TANK TOP, SIDE TANK AND ARCH BEAM CONSTRUCTION.

turing concerns, and would involve thousands of skilled mechanics being thrown upon the streets."

Alluding to the new dry dock scheme, at Levis, Sir Robert mentioned that the plans and detailed drawings had now been lodged with the dominion government, in accordance with the dry dock subsidy act of May last, and the joint stock company headed by the Canadian Pacific railway and the Allan line had been registered in Canada for carrying out this work. "The dock," said Sir Robert, "will be of the largest type, 1,000 ft. long, and will be entitled to the subsidy on the first scale guaranteed under the dominion dry dock act of 3½ per cent on $4,000,000 for 35 years."

The company's financial arrangements are all concluded, subject to the assent of the dominion government, and all the plans and schedules which were lodged witht the government on Sept. 28 are now under their consideration.

Annual Meeting of the American Ship Building Co.

THE annual meeting of the stockholders of the American Ship Building Co. was held in Jersey City, N. J., on Oct. 13. No change was made in the directorate or officers. W. L. Brown continues as chairman of the board of directors, James C. Wallace as president, Russell C. Wetmore as vice president and treasurer; Ora J. Fish, secretary and assistant treasurer; R. B. Wallace, general manager; James H. Hoyt, general counsel and M. A. Chew, assistant secretary.

The financial statement shows that the company is well entrenched, the sum of $884,322.27 being added to surplus, making the surplus as of June 30 last, $7,003,974.73. Cash on hand totalled $902,045.02. President James C. Wallace in his annual report says:

The year's business of the company has been quite satisfactory, both in volume and results.

CAPITAL STOCK.

• Remains unchanged from last year, viz.:

AUTHORIZED.

Preferred	$15,000,000
Common	15,000,000
Total	$30,000,000

ISSUED.

Preferred	$ 7,900,000
Common	7,600,000
Total	$15,500,000

Dividends.

Regular quarterly dividends of 1¼ per cent have been paid on the preferred stock, and four quarterly dividends of 1 per cent have been paid on the common stock.

PROPERTY OWNED AND CONTROLLED.

CLEVELAND, O.
Construction yard, machine shops, foundries, boiler shops, three dry docks.

LORAIN, O.
Construction yard, two dry docks, machine shop, boiler shop.

DETROIT, MICH.
Machine shops, boiler shops, foundry, brass works, three dry docks.

WYANDOTTE, MICH.
Construction yard, machine shop.

SUPERIOR, WIS.
Construction yard, machine shop, two dry docks.

CHICAGO, ILL.
Two construction yards, two machine shops, three dry docks.

MILWAUKEE, WIS.
Machine shop, two dry docks.

BUFFALO, N. Y.
Construction yard, machine shop, three dry docks.

PORT ARTHUR, ONT., CAN.
Construction yard, one dry dock.

Condition of the Property.

The various properties have been kept in good condition and up to the highest standard of efficiency.

At Buffalo there has been completed a new modern, fully equipped, 700-ft. dry dock, and in place of destroyed by fire, an office building and boiler house.

At Port Arthur, Canada, your chairman and president have given considerable attention to the work of construction, and hope that by Jan. 1, next, we will have in operation there, a 700-ft. dry dock, steel punch shop building, machine shop, building berth and equipment, and the plant generally in condition for operation, and we have very satisfactory assurances of a fair volume of business.

At Lorain a new forge shop, capable of making the heaviest forgings that are used in vessel construction, will be completed and in operation Nov. 1, next.

VESSELS BUILT.

Plants.	Vessels built.	Carrying capacity. Net tons.
Superior	1	9,500
Lorain	12	102,000
Cleveland	2	19,000
Detroit	6	23,000
Buffalo	2	.....
Chicago	0	.....

TOTAL.

Vessels built	23
Carrying capacity, net tons	153,500

Carrying capacity is based on 19-ft. draught.

Summary and Prospects.

The company has built and completed 23 vessels during its fiscal year, and now has under contract 12 vessels. The general introduction of larger and heavier ore unloading machinery is making certain changes in vessel construction necessary, and while the outlook for new construction seems limited and probably will be, we have assurances of considerable work in repairs and changes in construction that will give us a fair business during the year.

The financial report as submitted by R. C. Wetmore, treasurer, is as follows:

COMBINED ASSETS AND LIABILITIES, JUNE 30, 1910.

ASSETS.

Cost of real estate, buildings, machinery and tools, patterns, patents, models, furniture, fixtures, etc., as per books, including cost of stocks in subsidiary and affiliated companies		$17,904,086.12
Sundry bonds and stocks, at cost or less		884,400.00
Material and supplies, at market values		$10,267.03
Notes and accounts receivable:		
Notes receivable	$2,026,918.32	
Accounts receivable	1,880,087.75	
Accrued on uncompleted contracts	821,790.79	
		4,728,796.86
Cash		902,045.02
		$24,929,615.03

LIABILITIES.

Capital stock:		
Common	7,600,000.00	
Preferred	7,900,000.00	
		15,500,000.00
Notes and accounts payable		1,166,518.71
Reserves:		
For insurance	209,707.49	
For maintenance	500,000.00	
For dividends (payable July 15)	138,250.00	
For contingent earnings on unfinished construction, 1909-10	100,000.00	
For sundries (taxes, liability insurance, expenses, discounts, allowances, etc.)	311,164.10	
		1,259,121.59
Surplus, including working capital:		
Balance, June 30, 1909	6,423,652.46	
Less common dividends	304,000.00	
	6,119,652.46	
Surplus for year ending June 30, 1910:		
Earnings, including $100,000.00 contingent earnings on unfinished construction 1908-9 (before deducting maintenance and depreciation)	$1,980,654.21	
Less:		
Maintenance $272,032.19		
Rebuilding docks, etc. 271,299.75		
	543,331.94	
	$1,437,322.27	
Less preferred dividends	553,000.00	
	$ 884,322.27	
		$ 7,003,974.73
		$24,929,615.03

Note:—In addition to the foregoing there exists a contingent liability from the guarantee of first mortgage bonds on steamships built by the company, aggregating $1,535,000, and carrying interest.

Mr. Newberry and Shop Yard Management

In its October issue, THE MARINE REVIEW reprinted an article from *The Independent*, by Rear Admiral Caspar F. Goodrich, on "Mr. Newberry and Shop Yard Management." Brief reference to the article in the *Army and Navy Journal* drew comments from Rear Admiral George W. Melville which make quite interesting reading:

"The reference in the issue of the *Army and Navy Journal* of Sept. 24 to a brief article by Admiral Goodrich in the *Independent* of Sept. 15 may have led some who would not otherwise have seen it to look it up. The admiral has long been known as a clever writer, and as such he has the art of giving a specious attractiveness to ideas that are either inaccurate, irrelevant or else of the kind that have the same general acceptance as the Ten Commandments. Inasmuch as the admiral was, perhaps, the chief lieutenant of ex-Secretary Newberry in the abortive attempt to carry out what has been called 'the plan to disorganize the navy,' no one can blame him for frequent efforts to defend that scheme; but it is only fair, in the interest of accuracy and correct information, that attention should be called to the facts in the case and to some of the peculiarities of the *Independent* article.

"In the first place, the bulk of the article is taken up with a partial description and some examples of a most ingenious scheme of shop management, devised by one of our most brilliant engineers, but which, unfortunately, in the judgment of most competent experts, is entirely unadapted to the conditions of navy yard work. It would seem that any experienced naval officer ought to recognize that navy yards are unlike manufacturing establishments, which are employed almost entirely on repetition work, while the yards hardly have any two jobs exactly alike. Practically all shop 'systems' are based on the idea of repetition work, and the one which the admiral so justly admires for its ingenuity is particularly so. It is further to be said that, although this system receives general admiration from shop managers, they do not adopt it, recognizing that, unfortunately, only such talented men as its brilliant author can make it work.

"The admiral sketches an outline of a course of training for shop managers, which, with one addition (which he perhaps thought insignificant), would probably meet with general opproval. This addition is 'common sense,' which the most competent men nowadays are ranking higher than mental ability. Indeed, it has seemed to me right along that the Newberry system was wrecked just because it utterly ignored this vital element. Common sense would have suggested a careful investigation as to the methods employed by our great manufacturing and building establishments, *as far as applicable to navy yard conditions*, but there was no such investigation, if we can judge by results, because the Newberry system was unlike anything to be found anywhere. Indeed, the particular point to which the admiral refers with pride, the consolidation and concentration of shops, is exactly what the most progressive establishments are not doing. On the contrary, they are working toward the general lines on which the navy yards were conducted before the Newberry scheme.

"The little episode about the $50,000 superintendent is splendidly told, and it would convince anyone who didn't know what salaries really are paid. I do not doubt the admiral's account is correct, but it would have been still more interesting if he had given names and localities. My opportunities for information in this respect have been very good, and I am free to say that I do not believe any such salary has ever been paid. There is one good feature about this part of the discussion, namely, the disclosure of one naval officer of extreme modesty as to the ability of naval officers generally. We used to hear it charged against them that they considered their commission a sort of 'divine right,' enabling them to do anything. We now learn that this is all wrong, and that it is doubtful if they can be equal to filling positions which are filled efficiently by men without a tithe of their training and opportunity. Here again, it seems to me, a moderate application of common sense would have led the admiral to be more hopeful of his brother officers. There are now more than a thousand line engineer officers. The number needed for the chief positions in the navy yards is probably under fifty. To say that, with any kind of decent training, these fifty men cannot be obtained out of a thousand highly trained men, who are picked at the start, is beyond my powers of imagination. One can fancy the joy of any large manufacturing concern that had such a chance.

"Looking at the matter soberly, and without any bias, this question of navy yard management is not such a terrible puzzle to solve. It is a very old problem, and we have had it solved for a great many years. It only requires the usual expert knowledge and

common sense, both of which were and are available in ample supply. It is gratifying to all who love the navy that our present secretary went at the question in this simple and intelligent way, and I believe that the organization, as it has been planned by experienced officers and approved by him, is along correct lines. Within a few weeks he called a meeting of commandants of yards and chiefs of bureaus for conference as to progress and possible improvement. When such a spirit prevails success and the highest efficiency are assured.

GEORGE W. MELVILLE, Rear Admiral and Ex-Engineer-in-Chief, U. S. N. Retired.

"Admiral Melville's communication drew the following spirited reply from Admiral Goodrich:

"Those who are acquainted with ex-Engineer-in-Chief Melville will be able to make the proper allowances in reading his letter on 'Shop Management in Our Navy Yards,' printed in your issue of Oct. 8. Those who are not acquainted with him will be surprised, if not pained, to find a naval officer indulging in personalities when discussing a question which interests all who seek what is best for the service, and who are, therefore, glad to adopt any measure, however opposed to their own preconceptions, which shall achieve this desirable end.

"The public press is no place for insinuations of 'specious' advocacy of 'inaccurate' or 'irrelevant ideas' or 'Ten Commandment' truisms, except on the well known legal principle of abusing the plaintiff's attorney when you have no case; nor is the public press a proper place for answering such insinuations.

"The system, which the ex-engineer-in-chief assumes to be that of my preference, needs no defense from me. Those who have tested it and found it satisfactory are quite ready to speak in its favor. The best methods are none too good for the navy. I feel sure that, eventually, they will be installed in our yards. I care not by what name they are called or whence derived.

"I do not doubt the ex-engineer-in-chief in the least when he says that he is unaware of such salaries as the one I mentioned, $50,000 annually to the superintendent of a certain huge industrial plant. That he does not know of such salaries is, of course, no proof of their non-existence. More than half the human race do not know that the world is round.

"The statement that 'the most progressive establishments' are opposed to 'the concentration and consolidation of shops' is unsupported by instances adduced. The multiplication of shops doing the same kind of work, as under the old bureau plan, may be favored somewhere, possibly, but it hardly commends itself to that 'common sense' upon which he lays no more than the proper stress. Establishments with this tendency would most profitably be sought in the list of bankrupts. It is astounding to infer his approval of the ancient navy yard system from the remark that 'the question of navy yard management' is 'a very old question, and we have had it solved for a great many years.' I was mistaken, it seems, in thinking that particular solution wholly discredited and without defenders. If so admirable, why does he commend the present policy, which eliminates it?

"I have elsewhere said that the earnestness with which the subject is now being attacked forbids any doubt that a fitting organization and administration in our shore establishments will be sought and adopted, but it may be confidently predicted that 'the general lines on which the navy yards were conducted before the Newberry scheme' will be conspicuous by their absence.

"I am forced to wonder whether the ex-engineer-in-chief has read with any care my article in the *Independent* for Sept. 15, which he criticizes. It was a frank recognition of what has been done and is now doing; a counsel of hope and appreciation, not of despair and depreciation. It indicated the difficulties, which it did not seek to evade or ignore, and it pleaded for that training which alone is needed to enable our men, the very best of material intrinsically, to undertake with self-reliance and to discharge with credit their important responsibilities when detailed as shop managers. I trust that no one will form a judgment without consulting my own words.

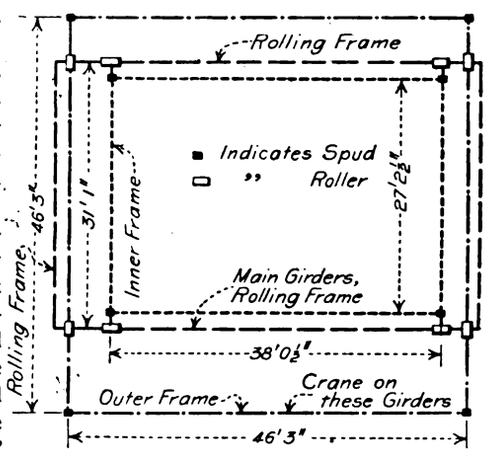
C. F. GOODRICH."

Self-Propelling Marine Staging

(From the *Engineering Record.*)

For some years there has been in use in England a so-called marine locomotive staging, which is a self-contained propelling platform capable of walking into the water and thus serving instead of temporary staging or barges for the construction of marine works or the excavation of subaqueous rock.

The first one was used at Peterhead, a fishing port north of Aberdeen, Scotland, for the removal of about 10,000 cu. yd. of granite, lying at a depth of about 24 ft. below high water. The North Sea along this coast is rarely calm enough to permit borings to be made from barges and severe storms come frequently and make it inadvisable to place floating equipment in exposed positions. This situation led to the design of the locomotive staging, which withstood heavy storms though the waves sometimes broke over the platform. The staging carried five drills, and was arranged to advance 5 ft. at a time, this distance corresponding to the spacing of the



RELATION OF PARTS OF MARINE STAGING.

holes. Air was brought to the drills from shore through a submarine hose, and as the five holes were completed they were blasted directly under the platform.

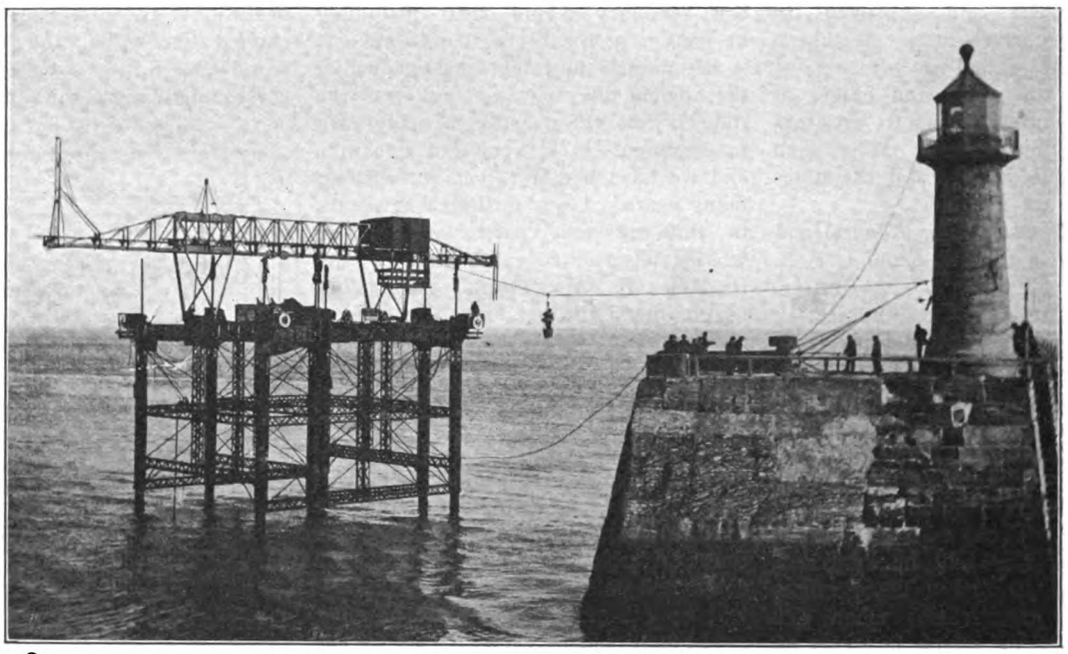
Subsequently this machine was moved to Dover, where it was used by the British Admiralty in blasting for deepening the harbor.

The stage shown in the accompanying photograph was built for Messrs. W. Hill & Co., for their work on the harbor improvements at Whitby, where it was used instead of temporary falsework for building the west pier extension. Two stages of this type were used on this work. The general dimensions are shown in the sketch herewith, all lengths being center to center of the framework members shown.

The device, it will be seen from the sketch and the photograph, consists essentially of two independent structural steel frame works, one within the other, so arranged as to move independently and to act as a support, the one for the other, in moving. Each frame has four legs or spuds which can be raised independently of each other. The method of operation is as follows: If it be assumed that the inner frame is to be moved, the legs on it are raised, in which condition it is carried on rollers resting on the outer frame. It is then hauled forward by tackles attached to the outer frame. The spuds on the inner frame are then lowered, and those on the

outer frame raised so that the outer frame is carried on rollers resting on the inner. The outer frame can then be pulled forward, the operations being continued until the staging reaches the desired place. In practice a third outer one carried a gantry with overhanging ends.

One of these stages is said to have traveled a total of 3,600 ft. over sand bottom, at a rate of 310 ft. in 10 hours, its stride being 10 ft. Later



SELF-PROPELLED MARINE STAGE AT WHITLEY HARBOR.

or rolling frame must be used, this frame acting as an intermediate carrying member between the inner and outer frames. The accompanying sketch indicates the relation between the parts of the machine. The inner frame travels on the rolling frame, and the latter, in turn, moves on the outer one. The height of the framework is 34 ft.

It will be noted that the machine can move forward or backward and sidewise, and that in this particular apparatus the forward and backward progress can be made in steps of about 10 ft., while the steps sidewise are limited to about 5 ft. Only four rollers are provided for the lengthwise motion and four for the sidewise, though the inner frame at times carries the outer and at others is carried by the outer frame. This is possible by the use of double tracks, one above and the other below each set of rollers.

The spuds are each operated by an independent motor with horizontal shaft carrying a worm engaging a gear placed as a collar around the upper end of the spud. This part of the spud is a threaded shaft, while the lower part is a stout square timber which works up and down inside a structural-steel leg, giving lateral strength.

The construction plant was mounted mainly on the inner frame, while the when the crew became more experienced a 10-ft. step was completed in 15 minutes. The motors operating the spuds are all controlled from one switchboard so that they can be operated by one man. Both stages were frequently exposed to rough weather without damage.

Beside using the machine for blasting, rock removal and the construction of piers, it can readily be used for setting caissons, recovering sunken cargo, making subaqueous borings and carrying out a variety of operations in exposed locations where barges would be unsatisfactory on account of their movement or temporary falsework would be expensive or would be endangered by storms.

A model of the staging is being exhibited at the United Engineering Societies' building, in New York, by C. G. Norris.

Progress of Parsons Turbine

Some interesting particulars of the progress of the steam turbine are given in the annual report, just issued, of the Parsons Marine Steam Turbine Co. The directors state that the application of the Parsons type in war vessels and in vessels of the mercantile marine has been greatly extended during the past year. Up to the present time the total horsepower of turbine engines completed and under construction in the works of the company and of licensees, as well as in the works of the Continental sub-companies and of licensees of Parsons' Foreign Patents Co., amounts to 4,500,000 h. p., an increase during the year of 1,250,000 h. p. Of this total nearly 3,700,000 h. p. are, or will be, employed for the propulsion of warships, and over 800,000 h. p. in vessels of the mercantile marine and yachts.

The British admiralty took the lead in the introduction of the Parsons type of turbine into warships, and has continued to employ that type in nearly all the vessels laid down during the last five years. At present the total number of vessels built and building for the Royal navy and the colonies with Parsons turbines is 143; the total horsepower is about 2,100,000. In all the important war fleets of the world the lead of the British admiralty has been followed, and the Parsons type of turbine has been largely used in recent ships. The United States navy department has adopted the Parsons type for the four large battleships now building, and for 15 destroyers. The French ministry of marine have adopted the Parsons turbine for all the eight first-class battleships now building, and for 10 torpedo vessels. In the German navy all the large armored cruisers recently laid down have Parsons turbines; that type has been adopted also for four protected cruisers and eight destroyers. The trials of the armored cruiser Von der Taun, fitted with Parsons turbines, have proved most satisfactory, the speed at-

tained on trial being 27½ knots, as against a speed of 25 knots said to have been contemplated when the design was prepared. In the Italian navy three large battleships, an armored cruiser, and three smaller vessels have Parsons turbines. Spain is building three battleships, three destroyers, and 10 torpedo boats, for which the same type of engines has been adopted. Denmark, Sweden, Brazil, Argentina and China have also made use of the Parsons turbine in recent war vessels. Experience on a very large scale in war vessels on actual service has now confirmed the favorable results obtained on the trials of turbine-driven ships.

Success in Mercantile Marine.

Equally satisfactory results have been obtained in vessels of the mercantile marine fitted with Parsons turbines. The Cunard steamships Lusitania and Mauretania have continued to maintain high speed and remarkable regularity of performance in all weathers on their voyages between Liverpool and New York. The Allan liners Victorian and Virginian and the Cunard steamship Carmania also continue to give great satisfaction. The French Trans-Atlantic Co. has adopted Parsons turbines for their new steamship La France, recently launched, for which the speed of 23 knots is contemplated. The Canadian Northern Railway steamships Royal George and Royal Edward (formerly Heliopolis and Cairo) are fitted with engines of the same type, and have performed their service between Bristol and Canada with great success. The Japanese steamships Tenyo Maru and Chiyo Maru, propelled by Parsons turbines, have fully realized the intentions of their design on their trans-Pacific service. It has been reported recently that orders have been given for a turbine-driven steamship for the service between England and New Zealand, and there is good reason for the belief that the Parsons type of turbine will be adopted to a much greater extent for oceanic service in vessels of high speed of the mercantile marine. In swift vessels of comparatively moderate dimensions, but great engine power, employed in cross-channel and coasting services, or for short voyages, the use of Parsons turbines has been considerable, and recently has been much extended. In Italy, France and the United States, as well as in Great Britain, recent and important examples of this development have occurred.

The "combination" system devised by Mr. Parsons, in which low-pressure turbines are associated with reciprocating engines, is also being developed for mercantile steamships of comparatively moderate speeds, and has given very satisfactory results in working, especially as regards fuel economy. Amongst the vessels in which this system has been adopted are the great White Star liners Olympic and Titanic, now building by Harland & Wolff, and the Laurentic, built by the same firm. A vessel for the Aberdeen Line, now building at Belfast, and an Orient Line steamer, builidng by John Brown & Co., Clydebank, are also to have the combination system applied. The New Zealand Shipping Co., who first tried that system in the Otaki (built by Messrs. Denny), have extended its use to other vessels as a result of experience. The steamer Rochambeau, now building in France, is to be similarly equipped.

Cargo Steamer Vespasian.

In the last report reference was made to the cargo steamer Vespasian, which had been purchased by the company, and was then being fitted with a system of geared turbines in order to demonstrate the possible economy in fuel, weight, and space which that system of machinery would secure, as compared with the best type of reciprocating engines fitted in cargo steamers of low speed and great deadweight capacity. During the past year extended trials of the Vespasian have been made, both on the measured mile and on ordinary service at sea; thorough investigations have also been carried out to determine the actual consumption of steam and coal. On the first trials, made off the Tyne, it was demonstrated that at ordinary sea speeds the geared turbines reduced the steam consumption 15 per cent as compared with the consumption required with reciprocating engines. Since these results were obtained the vessel has been continuously employed on sea service, carrying coals to Rotterdam, and returning in water ballast. She has completed 14 voyages, and steamed 8,500 miles in all weathers. The machinery has worked with entire satisfaction, giving no trouble whatever, and there has been a remarkable freedom from racing, even in the roughest weather. The results obtained on the first trials as to the relative economy in steam consumption, when compared with reciprocating engines, have been confirmed by the data obtained on these voyages. It may, therefore, be anticipated that the geared-turbine system will hereafter find extensive use in the very numerous and important class of cargo steamers of the British and other mercantile marines by which the carrying trade of the world is principally performed. Other important applications of the system of geared turbines are also under consideration and experimental investigation.

Society of Naval Architects and Marine Engineers

The eighteenth general meeting of the Society of Naval Architects and Marine Engineers will be held at the Engineering Societies building, 29 West Thirty-ninth street, New York, on Nov. 17 and 18. The banquet at the conclusion of the meeting will be held in the Astor gallery, Waldorf Astoria. The list of papers to be read and discussed follows:

Thursday, Nov. 17, 1910.

"Notes on the Armaments of Battle Ships," by Sir William White, K. C. B., honorary member.

"The Evolution of Screw Propulsions in the United States," Part II, by Charles H. Cramp, vice president.

"The History and Economic Value of Canals; with Special Reference to the Cape Cod Canal," by Jacob W. Miller, vice president.

"Coaling War Ships; Notes of Progress," by Spencer Miller, member.

"Floating Dry Docks in the United States; Relative Value of Wood and Steel for Their Construction," by William T. Donnelly, member.

"Our Constitutional Shipping Policy and the Compact for its Establishment," by William W. Bates, member.

"An Analysis of Tests of Watertight Bulkheads, with Practical Rules and Tables for Their Construction," by Professor Wm. Hovgaard, member.

"Comparative Results in Steam and Coal Consumption, with Turbines, Reciprocating Engines and a Combination of the Two, on the Steam Yacht Vanadis," by Clinton H. Crane, member.

"The Gyroscope for Marine Purposes", by Elmer A. Sperry, member.

"New Propelling Machinery of S. S. Creole," by John F. Metten, member.

"Some Suggestions for Reducing Loss by Fire on Shipboard," by Samuel D. McComb, member.

"Two Marine Installations of Producer Gas Power," by Charles B. Page, member.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., launched the freight and passenger steamer, Madison, for the Old Dominion Steamship Co., on Oct. 8. The Madison is 372 ft. long, 42 ft. beam, and 35½ ft. deep. She will be equipped with triple-expansion engines and Scotch boilers.

Building the Panama Canal ---For Whom?

(From the *New York American.*)

The United States is spending the stupendous sum of $375,000,000—which will probably be increased to $500,000,000—on the construction of the Panama Canal. After France failed in the task, this country took it up and is now pushing to a successful conclusion the greatest engineering feat the world has seen. The completed work will be a monument to American genius, enterprise and pride, but as a canal it will benefit *whom*? Take the Suez Canal, the present plexus of the world's seaborne commerce.

During the last recorded year, 13,633,283 tons of shipping passed through this canal. Of this tonnage more than 60 per cent was British, the balance being principally German and French. The United States tonnage was absolutely negligible. Judging from this, the Panama Canal will prove a marvelous benefit to shipping—but to whose shipping?

The Pacific, the ocean of the future, grows in importance every day, and especially in importance to this country, with its great western frontier facing the Orient. In the Pacific will be fought the battle of commerce and in the Pacific, should affairs come to a sterner contest, will be fought the great sea fight that shall decide the fate of nations. What have we done in the Pacific toward winning the battle of commerce? Nothing. The Great Northern Steamship Co. struggles against subsidized competition to keep up its Seattle-Japan service, and that is all.

In the meantime consider the Nippon Yusen Kaisha. In 1885, this Japanese company ran a small line from Kobe to Corea and Vladivostok. Now, with 79 steamships and a tonnage of 306,674, this company, in addition to its European service, maintains a fortnightly service across the Pacific to Seattle, and among other Pacific enterprises operates between Japan and China, Corea, Asiatic Russia, India and Honolulu in our own Japanned Hawaiian Islands. And, incidently, so far back as 1894, during the Chinese-Japanese war, this company alone transported to China 120,000 soldiers and 100,000 coolies. Is there no Philippine hint in this?

The opening of the Panama Canal, which we are constructing at such cost of labor and treasure, will marvelously increase and benefit shipping in the Pacific. Judging from the above, whose shipping? Isn't it time the United States prepared to reap some profit from its own enterprise, or is the alien, who already carries 90 per cent of our ocean commerce, to have it all?

Statistics for the Year

On June 30, 1910, the merchant marine of the United States, including all kinds of documented shipping, comprised 25,740 vessels of 7,508,082 gross tons. On June 30, 1909, it comprised 25,688 vessels of 7,388,755 gross tons. The following table shows the geographical distribution, motive power, material of construction, and trade of vessels of the United States for the fiscal year 1910, in comparison with similar data for the year 1909, and also the construction for the two years.

COMPARISON OF MERCHANT MARINE OF 1909 AND 1910.

Classification. Geographical distribution:	1909. Number.	1909. Gross tons.	1910. Number.	1910. Gross tons.
Atlantic and Gulf coasts	17,203	3,500,394	16,999	3,517,132
Porto Rico	83	8,740	85	5,541
Pacific coast	3,378	915,357	3,534	918,489
Hawaii	43	19,120	40	18,102
Northern lakes	3,199	2,782,481	3,273	2,895,102
Western rivers	1,782	162,663	1,809	153,716
Total	25,688	7,388,755	25,740	7,508,082
Power and material:				
Sail—Wood	9,580	1,465,446	8,811	1,405,692
Metal	132	245,630	136	249,781
Total	9,712	1,711,076	8,947	1,655,473
Steam—Wood	9,783	1,157,510	10,534	1,130,535
Metal	1,858	3,591,714	1,918	3,769,826
Total	11,641	4,749,224	12,452	4,900,361
Canal—Wood	745	80,951	674	74,068
Barges—Wood	3,449	760,465	3,508	780,300
Metal	141	87,039	159	97,880
Total	3,590	847,504	3,667	878,180
Grand total	25,688	7,388,755	25,740	7,508,082
Trade—Registered:				
Sail—Wood	448	185,728	354	125,303
Metal	22	45,330	18	33,574
Total	470	231,058	372	158,877
Steam—Wood	349	71,474	354	64,364
Metal	149	507,052	143	492,613
Total	498	578,526	497	556,977
Barges—Wood	644	72,277	636	70,327
Metal	21	5,644	21	5,644
Total	665	77,921	657	75,971
Total registered	1,633	887,505	1,526	791,825
Enrolled and licensed:				
Sail—Wood	9,135	1,281,064	8,457	1,280,389
Metal	107	198,954	118	216,207
Total	9,242	1,480,018	8,575	1,496,596
Steam—Wood	9,431	1,084,690	10,180	1,066,171
Metal	1,712	3,086,008	1,775	3,277,213
Total	11,143	4,170,698	11,955	4,343,384
Canal—Wood	745	80,951	674	74,068
Barges—Wood	2,804	687,924	2,872	709,973
Metal	121	81,659	138	92,236
Total	2,925	769,583	3,010	802,209
Total enrolled and licensed	24,055	6,501,250	24,214	6,716,257
Grand total	25,688	7,388,755	25,740	7,508,082
Construction during the year:				
Geographical distribution:				
Atlantic and Gulf coasts	582	108,904	601	150,828
Porto Rico	8	85	7	131
Pacific coast	276	22,759	279	16,870
Northern lakes	174	100,402	281	168,751
Western rivers	207	5,940	193	5,488
Total construction	1,247	238,090	1,361	342,068
Power and material:				
Sail—Wood	132	20,965	121	15,659
Metal	9	7,985	6	3,699
Total	141	28,950	127	19,358
Steam—Wood	754	25,066	842	23,005
Metal	67	123,142	94	234,988
Total	821	148,208	936	257,993
Canal—Wood	21	2,292	50	5,720
Barges—Wood	251	52,844	229	47,060
Metal	13	5,796	19	11,937
Total	264	58,640	248	58,997
Total construction	1,247	238,090	1,361	342,068

A Method of Using Fuel Oil in Vertical Donkey Boilers

By Robert T. Earle.*

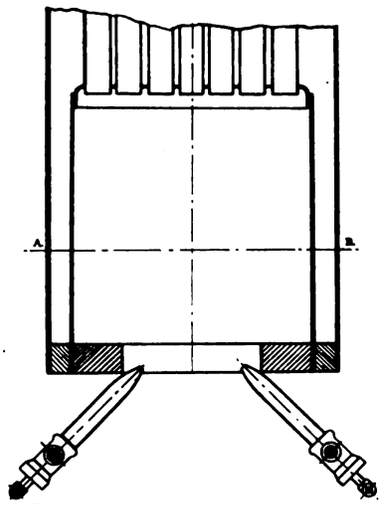
The burning of oil in the firebox of vertical donkey boilers has been attended with some difficulties, chiefly dut to faulty installation. Many people have installed oil burners in donkey boilers in such a way that in a short time the beading on the end of the tubes would be burned off, causing leaks and destroying the tube sheet. The heat would not be uniformly distributed among the tubes as it ought to be, and the boiler would in consequence not steam properly, since the tubes through which the flame did not pass would fill up with soot and the heating capacity of these tubes was lost.

After many experiments and many failures I found that by putting two burners in a vertical boiler, set opposite each other under the mud ring, at an angle of about 90 degrees with each other so that the flame from both burners would meet in the center of the boiler about 20 to 24 in. below the tube sheet, good results could be obtained.

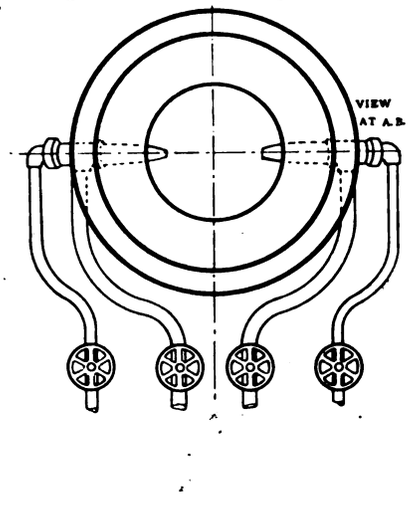
In setting these burners care must be taken that the flames do not meet exactly in the center, but pass a little to one side, giving them a whirling motion. In this manner the flames will fill the firebox and spread over the whole tube sheet and be drawn up through each and every tube.

In this installation no brick are needed around the firebox. I found that an iron plate placed in the bottom of the boiler below the mud ring, and covered with brick so that the mud ring rivets are protected, is all the iron or brick work needed. There should be a hole in this plate to admit the air necessary for proper combustion. I have cut a 12-in. hole for a boiler 60-in. diameter, but I found I had considerable black smoke. A hole about 14 in. diameter gives a nice bright fire. I would advise that a large hole be cut in the plate before fitting in place; it can be easily covered if too large. Conditions will govern the amount of air required.

It takes some little experience to regulate the amounts of oil and superheated steam necessary to secure the right mixture and obtain the most heat with the least smoke. Be sure to keep the tubes clean, but if the oil is atomized properly there will be very little smoke to cause soot deposit in the tubes. With burners set in this way, no part of the firebox receives the direct flame from the burners. It is the flame impinging on the tube sheet that injures it.



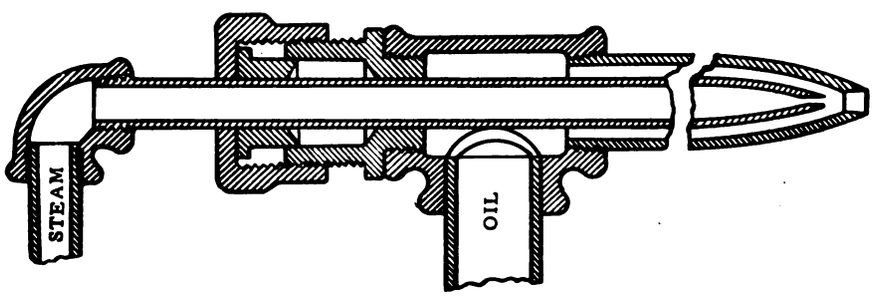
Position of Atomizer in Firebox.



Bottom of Firebox.

The flames meeting in the center, too, gives better combustion, as particles of oil that may escape unignited from one burner are burned upon meeting the flame from the other.

The burners are placed at the bottom of the boilers so that they will not be injured if it should be necessary to start the fire with wood. No pump is required if the bottom of the oil tank is placed not less than a foot higher than the mouth of the burner. The oil should flow to the burners as directly as possible. Connections between the burners and the oil pipe should be made with a piece of heavy hose, so that the burners may be adjusted to the proper position. The steam pipe to the atomizer can be arranged with double ells, ball joints or steam hose for the same purpose. Steam for atomizing purposes should be taken from the highest point on the boiler, and by a separate opening, as the fire does not burn evenly, if the pressure in the atomizer pipe fluctuates and this is necessary for economy. The dryer the steam the better for atomizing purposes. Good results can be had with oil at a temperature of 100 degrees and my experience has proven that this apparatus, if properly applied and adjusted, will give good satisfaction.



Detail of Burner.

There is nothing difficult or mysterious about burning oil. Examine a lamp; note how well it burns if the burner is clean and the chimney is in its place drawing air up through the flame. Then stop up a few of the air holes in the burner, and notice the flame; raise the chimney and note how the flame smokes and flutters. A little thought will do the work; any man with pipe tools and a little knowledge of their use can make and install the apparatus.

The burners are known as inside mixers, and are made of pipe flattened on the end to form a mouth. The atomizer is flattened and placed inside the burner; the mouth of the atomizer should be about 1/32 or 3/64 in. wide and as long as necessary for the burner used. One-inch pipe flattened to 1⅜ in. by 5/16 in. or ¼ in. for each burner will give good results in a 60-in. boiler. The atomizer pipe is ¼ or 3/16 in. pipe flattened as above and placed about 1¾ in. or 2 in. back from the mouth of the 1-in. oil pipe. This distance must be regulated to suit conditions, such as quality of oil and steam pressure carried. The plan and detail of the burner show the arrangement. The atomizer pipe passes through a stuffing box in the tee of the burner so that it can be easily adjusted. Once set it need not be moved except to clean out.

*Master mechanic, Oregon & Eureka R. R.

THE MARINE REVIEW

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Naval Reorganization

It is with especial gratification that THE MARINE REVIEW invites attention to the communication printed elsewhere on the subject of naval reorganization; a subject which day by day occupies more and more of the attention of press and public. It is all the more appreciated because of its spontaneity and the unimpeachable character and high standing of the author. It is regrettable indeed that, as he says, the time is inopportune for the disclosure of his identity, although his letter contains nothing which any naval officer might not say without reproach. The attitude of Secretary Meyer toward any who do not unreservedly subscribe to his policy, however, is full justification.

At the same time THE MARINE REVIEW regrets that it cannot wholly agree with the author's views, which are, quite naturally, more or less affected by long naval association. It is quite true that the furnishing of the numberless items of equipment is an incumbrance upon a purely manufacturing department, but on the other hand, the organization and maintenance of a bureau for the purpose is the height of absurdity. It is a store keeping proposition pure and simple and is on all fours with the general store of any large ship building concern which has exactly parallel functions to perform in the delivering of a complete ship. The equipment is either made by the department or purchased in the open market; in the former case the manufacturing department takes care of its production and makes delivery as ordered; in the latter the bureau of supplies and accounts makes the purchase and delivers as required, either to the ship, the shops or the store. The purchases have all to pass through the hands of the bureau of supplies and accounts sooner or later in any case. Assuredly a separate bureau merely for requisitioning and distribution is totally unnecessary.

We have heretofore expressed our opinion regarding Secretary Meyer's staff of aides and their value, and there is no occasion to repeat it here.

When the navy yard is conducted as an industrial and not a military establishment and the commandant and all his train of line officers are banished, results may be looked for and not sooner. This does not involve removal from central control at Washington nor any diminution of effectiveness in the execution of repairs or construction, rather and emphatically the contrary. Ships will be ordered to navy yards and surveys made and repairs decided upon as now, but the execution of all work of whatever nature and the care of all shore property and equipment should be vested in one manager, whose direct superior is the secretary at Washington. Let the bureaus and the general board wrangle as much as they please over designs, as we have before remarked they are principally guesswork anyway, but keep them out of the shops and yards.

Keep the politicians and bosses and heelers away and put the yards on the same basis as to hours and customs as the best industrial establishments in similar work; put into effect a workable, sensible cost system which will tell something, not the crooked, unintelligible juggling which is now in vogue; make a manager's tenure of office dependent on his efficiency and ability and pay the price necessary to get the very best as shown by his record and leave his hands untied and the United States will begin to get something for its money. Necessarily he must be a man of varied attainments and unusual ability but the United States has enough to supply the demand. The chief difficulty lies within the department itself.

Preserve the Wolverine

The proposition of the Navy Department to dispose of the U. S. S. Wolverine (formerly the U. S. S. Michigan) by sale to the highest bidder may lead to some objections on the part of the people on the Great Lakes, who have come to regard that vessel with the veneration attaching to an honorable relic. This may be sentiment, but it will not be the first time that a popular emotion has interfered with an official purpose. It is hardly to be expected that the Wolverine will bring more than $2,000 if sold in this manner, and this may be urged as a reason why the ship should be preserved on account of the interest attaching to the vessel by virtue of its history. The Wolverine was the first iron vessel afloat on the Great

Lakes and the survival of the ship is an illustration of the difference between fresh and salt water agents for the deterioration of iron vessels. The hull was designed by Naval Constructor Samuel Hart, while the engines and boilers were designed by C. W. Copeland, a famous engineer of his day. The hull was built of iron, the material being prepared at Pittsburg and transported to Erie. The ship was launched in 1843 and made the first cruise on the Great Lakes the next spring. The first commanding officer was William Inman and the first chief engineer was Andrew Hebard. The disposal of the Wolverine brings up the interesting question whether the Navy Department may not now take steps to have built the gunboat, carried on the records as "No. 16," authorized by Congress in May, 1898, with an allotment of $260,000, which was also the limit of cost. Not muuch of a gunboat can be built in these days for any such sum, and it is estimated that a vessel of that type would now cost $350,000 at least. The boat was not built at the time it was authorized on account of the treaty prohibitions between this country and Great Britain respecting the maintenance of an armed naval force on the Great Lakes. Perhaps the obstruction may be considered as partly removed by the disposition of the Wolverine.—*Army and Navy Register.*

Well, the Navy Department must be hard up, very hard up indeed, if it wants to sell the Wolverine, better known as the Michigan. The sale of this vessel, the oldest iron vessel in existence, would be little short of a crime. There is no earthly excuse for it. For the business which she has to do, she is just as good today as she ever was. She represents better than any other inanimate object could the cordial relations which exist between the United States and its great neighbor. A modern gun boat could blow her to pieces in a minute, but her very weakness is her greatest strength. She is formidable in her antiquity. This old gun-boat is dear to every port on the lakes. She is as much an institution to the lakes as the little red school house is to the country village. She was in commission before the Mexican war was fought. As ships go nowadays, she was old when Farragut's flag-ship, the Hartford, was launched. She was guarding the American frontier when the British batteries were hammering down the walls of Sebastopol. She was nearly 20 years old when the civil war broke out and she has seen empires come and go.

The Wolverine is not only the first iron vessel to float on the great lakes, but she is also the first war ship to be built of iron in the world. She is the oldest iron vessel in existence, and there is no reason why, with proper care, she may not be doing duty a century hence. She is the most interesting warship afloat today, and to sell her would be a very great pity indeed. She has been a very valuable ship in more ways than one. Much of our steam engineering knowledge is derived from experiments carried out on the Michigan by B. F. Isherwood, afterwards engineer-in-chief of the United States navy. It is not likely that the people of the great lakes will permit this historical old vessel to be disposed of.

Mr. Goulder's New Firm

Messrs. S. H. Holding and F. S. Masten retired on Oct. 15 from the law firm of Goulder, Holding & Masten, Mr. Goulder continuing the business in the old offices in the Rockefeller building. Mr. Goulder's new firm is now in process of organization and an announcement of its personnel will probably be made within a few days. Mr. Goulder as general counsel for the Lake Carriers' Association has been identified with lake practice since his young manhood. His reputation as an admiralty lawyer is international and there have been practically no admiralty cases of any importance on the lakes in which he has not represented either one side or the other. His mental cast is both constructive and judicial and his judgment is highly prized in lake circles. Few movements of any importance affecting the general business of the lakes have ever been made without Mr. Goulder's advice. Mr. Goulder has decided to admit to partnership, W. W. White, who has been employed in his office for some time, and his organization when completed will be well rounded and competent.

Slump in Shipments

The ore movement during October reached the respectable figure of 4,877,441 tons, which is, however, somewhat less than the trade expected. The movement shows a loss of 1,748,360 tons, compared with October, 1909, when 6,625,801 tons were moved. Shipments to Nov. 1, however, show a gain of 3,712,974 tons over the corresponding movement last year, reaching altogether 39,978,308 tons. The ore slump which set in two months ago, however, will be further accelerated during November, and the trade does not now expect that the shipments for the full season will be sensibly greater than those of last year. So many vessels have been put into ordinary and so many shippers have concluded to close the season on Nov. 15 that the movement during the closing weeks this year must be very much less than the movement after Nov. 1 last year, when 5,418,745 tons were moved. The Steel Corporation will ship its last cargoes on Nov. 19.

The lake season is rapidly drawing to a close and will practically be over in a fortnight. The Pittsburg Steamship Co. has retired all its barges and will send many of its steamers into winter quarters as soon as they have made another trip. The ore movement will, therefore, show a very heavy slump during November and the total movement for the year will not be very much more than that of 1909.

Following are the shipments by ports:

Port.	October, 1909.	October, 1910.
Escanaba	928,175	639,444
Marquette	528,195	309,283
Ashland	714,271	380,839
Superior	1,003,956	1,317,902
Duluth	2,002,861	1,223,710
Two Harbors	1,448,343	1,006,263
Total	6,625,801	4,877,441
1910 decrease		1,748,360

Port.	To Nov. 1, 1909.	To Nov. 1, 1910.
Escanaba	4,930,971	4,507,517
Marquette	2,507,712	2,998,503
Ashland	3,136,275	3,817,669
Superior	5,747,454	7,802,254
Duluth	11,850,038	13,089,262
Two Harbors	8,092,884	7,763,103
Total	36,265,334	39,978,308
1910 increase		3,712,974

Lake Michigan ore receipts during October were as follows:

South Chicago, Ill.	473,127
Milwaukee, Wis.	17,474
Elk Rapids, Mich.	9,397
Boyne City, Mich.	13,626
Indiana Harbor, Ind.	17,579
Gary, Ind.	215,815
Fruitport, Mich.	3,404
Elk Rapids, Mich.	4,739
Total	755,161

Annual Report Great Lakes Engineering Works

The annual report of the Great Lakes Engineering Works for the fiscal year ending Aug. 31, 1910, has just been published. It shows that during the year the company built and delivered nine vessels and repaired about 40 vessels in dry dock. President Pessano in his report to the stockholders under date of Oct. 25, promises that the new ship yard at Ashtabula will go into commission during the present fiscal year. The buildings in the new yard are to be of

steel and concrete, and a graving dock capable of handling the largest ships on the lakes will be built of concrete. The plant at St. Clair will be sold and the proceeds expended at Ashtabula. During the year a quarterly dividend of 1½ per cent was paid and the sum of $183,884.28 added to surplus, making the total surplus $431,816.19, after setting aside the sum of $162,500 for special reserves. The company recently floated a bond issue of $750,000 to retire existing bonds and to provide capital for the new ship yard at Ashtabula.

Obituary

A well-known figure in marine circles passed away in Detroit on Thursday, Oct. 27, in the person of Wm. C. Barr, late manager of the Algoma Central Steamship lines. Mr. Barr was born in Detroit in 1853, his parents moving to Port Huron while he was yet at an early age. In 1872 he shipped as an oiler on the steamer Montana, which was launched at Port Huron in that year for the Western Transit line. In the subsequent phenomenal development of the lake marine he was a well-known and prominent figure. Although his education was that afforded by the city schools, Mr. Barr, because of his discriminating and receptive mind and liberal temperament, became a leader among marine engineers. Observant and contemplative, his mental processes seemed to lead him to conclusions which were seldom in error and which, once formed, were held tenaciously, but modestly, and his mode of expression was characteristic; moderate, dignified, yet positive. Modest, almost secretive, as to his own works, he withheld nothing of the credit due to others, and many of the best marine engineers of today owe much to his quiet help and advice and to the judicious good words on their behalf spoken in due season.

In the summer of 1900, Mr. Barr was appointed fleet engineer of the Algoma Central Steamship lines by F. H. Clergue, "the Jason of Algoma," who had wrought the industrial transformation of the Canadian Soo. Clergue needed ships and had bought and brought to the lakes several British-built cargo steamers in addition to a fleet of tugs, passenger and local freight ships, and soon recognized Barr's ability and thorough training as a steamboat man. In the autumns of 1900 and 1901, Mr. Clergue sent his cargo ships down to the sea and kept them employed in European trade and Barr was sent to Europe to look after them, which he did with conspicuous success and in 1902 was made superintendent of floating property for the allied companies and later manager, which position he held up to the fall of 1908, when he was obliged to retire because of a physical breakdown, due to ptomaine poisoning from which he never recovered.

A good companion and keen sportsman, generous and kind hearted even to his own injury, with never an unkind word or criticism of others; a quiet, patient and efficient executive, he will be remembered and missed most by those who had the best opportunity of forming a correct judgment.

Lyman C. Smith, well known on the lakes as the head of the United States Transportation Co. and vice-president and treasurer of the Toledo Ship Building Co., died at his home in Syracuse, N. Y., on Nov. 5. He was better known throughout the country as the manufacturer of the Smith Premier typewriter, out of which industry he amassed a large fortune. Mr. Smith was born at Torrington, Conn., March 31, 1850.

Louis C. Taylor, secretary of the Durable Wire Rope Co., of Boston, Mass., died on Oct. 27.

Henry S. Sill, of the firm of Worthington & Sill, died on Oct. 14. Mr. Sill was one of the best known insurance men on the lakes.

FOUNDERING OF PERE MARQUETTE 18

THE findings of the board of local inspectors of steam vessels for the district of Milwaukee as a result of their investigation of the sinking of the car ferry Pere Marquette 18, have been forwarded to THE MARINE REVIEW by Supervising Inspector Westcott, of the eighth district, and are as follows:

Having completed the investigation of the sinking of the steamer Pere Marquette 18, on Sept. 9, 1910, we have to report as follows:

We examined 26 witnesses and from the testimony submitted, we have arrived at the following conclusion, viz.:

The steamer Pere Marquette 18 left Ludington, Mich., at 11:40 p. m., Sept. 8, 1910, bound for Milwaukee, Wis., with a cargo of 29 loaded cars. Some of the cars were loaded with general merchandise and others with coal. The wind was blowing fresh from the north and a heavy sea was running and continued to make during the night.

At 3 o'clock in the morning of Sept. 9, 1910, an oiler went aft to oil the bearings for the main shafts. These bearings are about 7 ft. below the floor of what is known as the "flicker" or sleeping quarters of the oilers, firemen, water tenders and deck hands.

The oiler found that the entire compartment was full of water and could not get down to the shafts as this water was almost up to the "flicker" floor. He then went back to the engine room and reported to the engineer on watch.

The engineer then went to the pilot house and reported the case to the officer on watch, that "there was something wrong aft. The pumps were on and the water was gaining on them."

The first officer went aft then to investigate and returned to the pilot house and remarked to the wheelsman that "only a deadlight was busted, and it didn't amount to much." The captain was then called and took charge of the ship.

The captain, first officer, and some others of the crew went to the "flicker" and tried to stop the leak in the deadlight, which was on the starboard side. Every one aboard the ship was then called and the vessel headed for the west shore.

While the first officer and the crew were down in the "flicker" trying to stop the leak in the deadlight, three deadlights on the port side gave way, admitting large quantities of water which drove every one out of the "flicker" and completely filled the "flicker" and whole after part of the hull with water.

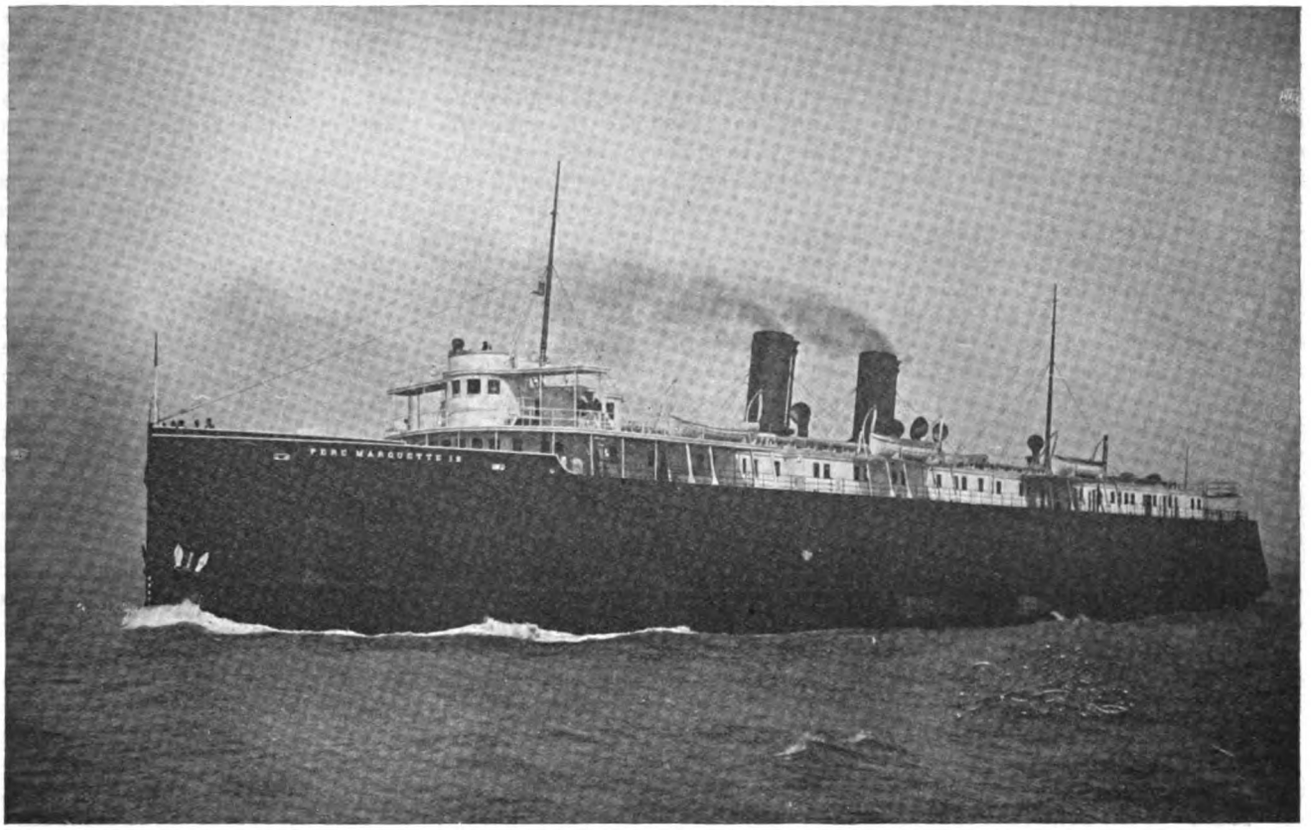
In order to offset this added weight of water in the hull, the master ordered some of the cars to be run overboard. After putting over 12 or 13 cars, the ship seemed to lighten up aft and the crew felt easier.

At about 4:15 a. m., wireless messages were sent out for help and the life preservers were gotten out for the people aboard. Three life boats were safely launched on the port side and men put into them to keep them fended off from the side of the ship. The steamer seemed to be settling aft.

At about 6:30 a. m., the steamer Pere Marquette 17, a steamer of the same line, was sighted. Distress signals were blown and flags raised. The Pere Marquette 17 bore down upon the Pere Marquette 18 with all possible speed and arrived close up to the 18 at about 7:15 a. m.

The Pere Marquette 17 came up to the No. 18 on the starboard side, which was the weather side. The master of the No. 18 then motioned to come up on the lee side, or port side, which was done. Very shortly after, the No. 18 listed heavily to starboard, the stern started to go down, the bow raised, and she sank very rapidly.

The people aboard the Pere Mar-



PERE MARQUETTE 18, WHICH FOUNDERED ON LAKE MICHIGAN.

quette 18 then began to jump overboard. The life boats of the Pere Marquette 17 were lowered immediately and the work of rescue begun. These boats picked up 32 people. As near as we can ascertain, 27 lives were lost, many because of the sea and floating wreckage.

As to the cause of the accident, we are unable to locate definitely any primary cause. We are of the opinion that the breaking of the three deadlights on the port side, undoubtedly put the finishing touch to the vessel; but as to how the water first got into the after compartment or why it was not pumped out, we are unable to ascertain, inasmuch as all of the officers of the ship, and who had the actual workings of the ship in charge, were lost. Not a single officer survived.

We are confident that the large amount of water found in the after compartment by the oiler at 3 a. m., could never have made through the defective deadlight on the starboard side. From all evidence we could get relative to this deadlight, the amount of water it made could not have filled the after compartment, and any pump aboard the boat would have more than taken care of this leakage.

From the evidence submitted, we find that there were at least two other means whereby water could get into the after compartment without the knowledge of the occupants of the "flicker."

One is by way of the sea-cock for filling the compartment, which might have been opened and closing neglected, or through the 18-in. deck scuttles. The sea might have washed off a scuttle cover and allowed the compartment to fill.

It will always be a matter of conjecture as to what first filled the after compartment before discovery, as those who would know are lost. It is an assured fact, however, that the whole after compartment was full of water at the time of sinking.

Some water was let in forward, and this, together with the cars on the forward deck, placed the ship on an even balance. Then something occurred which destroyed this balance and caused the vessel to sink stern foremost, but what this was, we cannot say definitely. It may have been the giving away of a bulkhead, allowing the water to flow into the engine compartment, or it may be that the cars on deck forward became unfastened and run to the after part of the ship. We have evidence from one man who started to go to the car deck from the forward part of the boat, and he claims that there was not a car on the deck.

As regards the great loss of life, we regret that we are obliged to censure the judgment of one who is dead and unable to defend himself.

It is our opinion, that the master of the Pere Marquette 18 displayed very poor judgment in holding the crew aboard the boat as long as he did. As much as two hours before the vessel sank, we feel that his knowledge and ability as a seaman must have told him, that his ship was in a very precarious condition and dangerous to be aboard of. We think that his efforts were directed more towards saving the ship, than to the saving of the lives aboard his boat.

Respectfully submitted,
(Signed) FRANK W. VAN PATTEN,
(Signed) WILLIAM A. COLLINS,
U. S. Local Inspectors.

As the report says, the source of the water first discovered in the after compartment will probably remain a mystery. There are, however, several possible solutions.

The open sea cock may be dismissed at once. It certainly was not opened after leaving port and it would not require much of a sea cock to flood the after compartment in over three hours, even if it had only been opened immediately before leaving. Was the oiler's round at 3 a. m. the first after leaving port? That could scarcely be. The watches must have changed at midnight and certainly all shaft bearings must have been examined before the ship had been at sea over three hours, and the presence of water from an open sea cock could not possibly have been overlooked.

So with the deadlight and the deck scuttle; any large volume of water making through them could scarcely escape the attention of those below. The giving way of three deadlights probably only hastened the end which was already inevitable.

The entirely probable point of entry was by way of a fractured stern tube or broken stern tube gland. Neither are unknown though fortunately not common, but the volume of water which would find entrance would easily account for the situation as

the oiler found it. In steel ships a fractured tube rarely leads to more than the filling of the peak, but if sluices are fitted and not closed the after hold of course fills also; a gland failure on the other hand floods the after hold compartment directly.

In ships intended for work in heavy ice, as with all cross-lake car-ferries, it is also a common practice to fit one or more large sea-cocks well aft to provide injection water for the condensers because they are less liable to become choked with ice than those further forward, and broken sea cocks and nozzles are also not by any means unknown.

The giving way of three deadlights in a seaway is open to some question unless it is to be believed that they were miserably defective. Pere Marquette 18 was no experiment, however, and embodied the experience of a number of earlier ships built for hard work in winter gales and drifting and pack ice and that her water line fittings were of such a flimsy nature is not credible. Even if the lenses were stove in the blind shutters should have been sufficient. They were not stove by the boats alongside, nor by wreckage from the jettisoned cars because it was not until after they were said to have given way that either boats or cars were put overboard. Undoubtedly the bulkhead did give way, probably due in part to some surging of the water in the after hold caused by the sea running at the time.

The case is unique, in the history of lake navigation at least, in that while other ships have passed out mysteriously they left no soul to give any intimation of what befell. Here, thirty-two people are rescued and yet not one who knows why the Pere Marquette 18 foundered. The Western Reserve left one messenger to tell us that she broke in two, but from the Gilcher, Bannockburn, Hudson, Ira Owen, Clemson, Marquette & Bessemer No. 2, and others came no word to tell of their last hours. From the Cyprus one man came ashore to say that she had taken in water through her hatches.

Of all these, that of the Bannockburn is the most baffling. The others had to fight for their lives in heavy weather; she disappeared in cloudless, calm summer, without a trace. Built for ocean service, of the well known and tried tramp type, she came to the lakes and was swallowed without time to get over a boat or for a man to snatch a cork jacket. Surely the inland seas are not without their share of mystery.

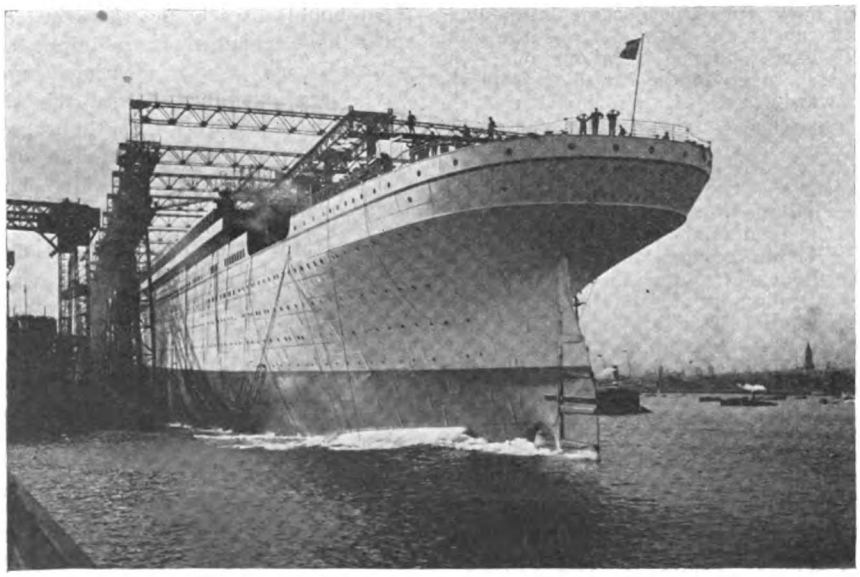
LAUNCHING THE OLYMPIC

THE Olympic, of the White Star line, was launched from the yard of Harland & Wolff, Belfast, Ireland, on Oct. 20. This great triple-screw steamer exceeds by nearly 100 ft. in length and 13,000 tons' displacement any other ship afloat. Her principal dimensions are:

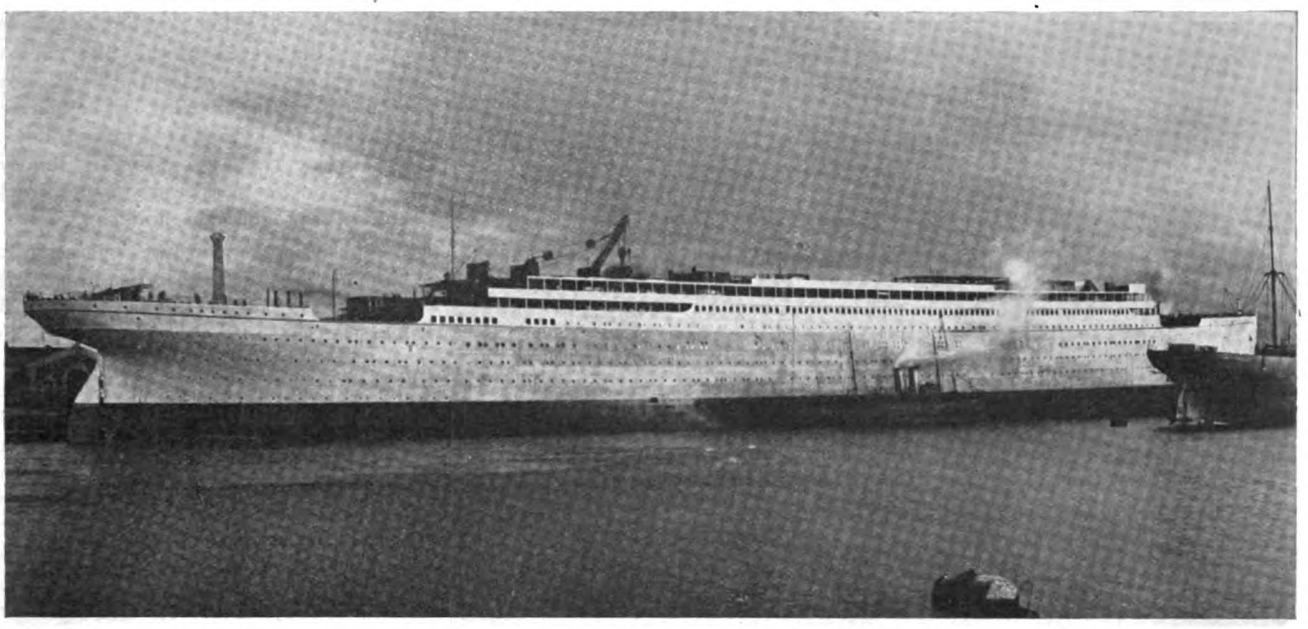
Length over all	882 ft. 6 in.
Breadth over all	92 ft. 6 in.
Breadth over boat deck	94 ft.
Height from bottom of keel to boat deck	97 ft. 4 in.
Height from bottom of keel to captain's house	105 ft. 7 in.
Height of funnels above casing	72 ft.
Height of funnels above boat deck	81 ft. 6 in.
Distance from top of funnel to keel	175 ft.
Number of steel decks	11
Number of watertight bulkheads	15

The launching weight, about 27,000 tons, was the heaviest weight ever transferred from land to water, and this operation, always (in spite of long erperience) a matter of anxiety to those responsible, was naturally, in the case of such a vessel, an undertaking of unusual importance. The method of launching, however, was one of the simplest imaginable, the vessel being held on the ways by hydraulic triggers only requiring to be released by the opening of a valve in order to let the vast structure glide into the water.

Besides being the largest and heaviest vessel ever launched, the "Olympic" is undoubtedly also the strongest. Both in design and workmanship this has been kept in view, and the most approved structural arrangements suggested by the ripest experience have been adopted, and every mechanical device requisitioned to secure this end. Never before in the history of shipbuilding have such elaborate means been employed, or such a combination of science, invention and skill in the production of a ship; nothing has been left to chance; everything has been carefully thought out and skillfully planned, down to the most minute details, and from keel to truck the "Olympic" will be as perfect as human ingenuity and skill and the most powerful appliances can make a vessel. The double bottom, extending the whole length of the vessel, 5 ft. 3 in. deep (increased under the reciprocating engine room to 6 ft. 3 in), the massive beams and close framing, the large shell plates, the steel decks and watertight bulkheads combine to make a structure of exceptional strength and rigidity. The hydraulic riveting in the vessel is also an important factor, the whole of the shell plating up to the turn of the bilge being riveted by hydraulic power, and an immense amount of this riveting having also been carried out in other parts of the vessel—shell, top sides, decks, stringers, etc. The rivets were closed by means of the powerful 7-ton riveting machines suspended from the traveling frames on the gantry; and while making the sound, tight connection so essential in this mighty hull, the rivets studding the shell plating present a



LAUNCHING THE OLYMPIC.

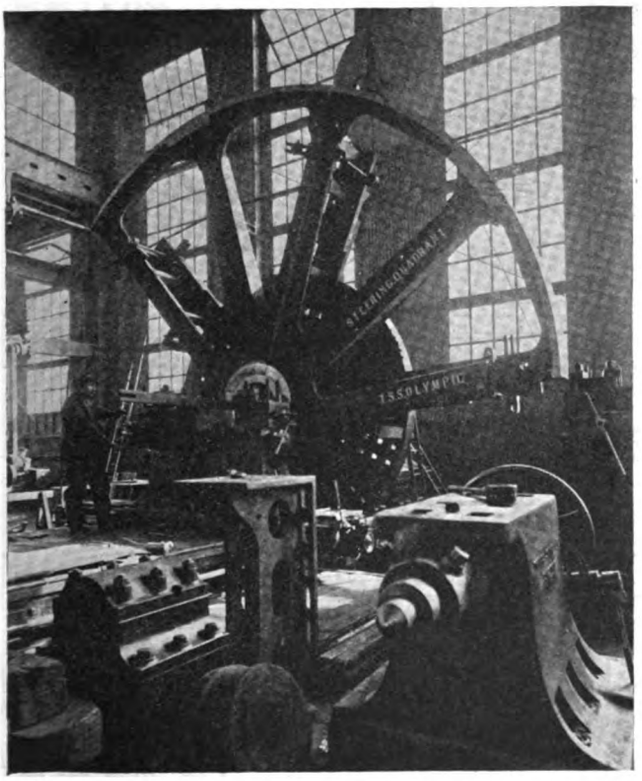


THE OLYMPIC, TAKEN IMMEDIATELY AFTER LAUNCHING.

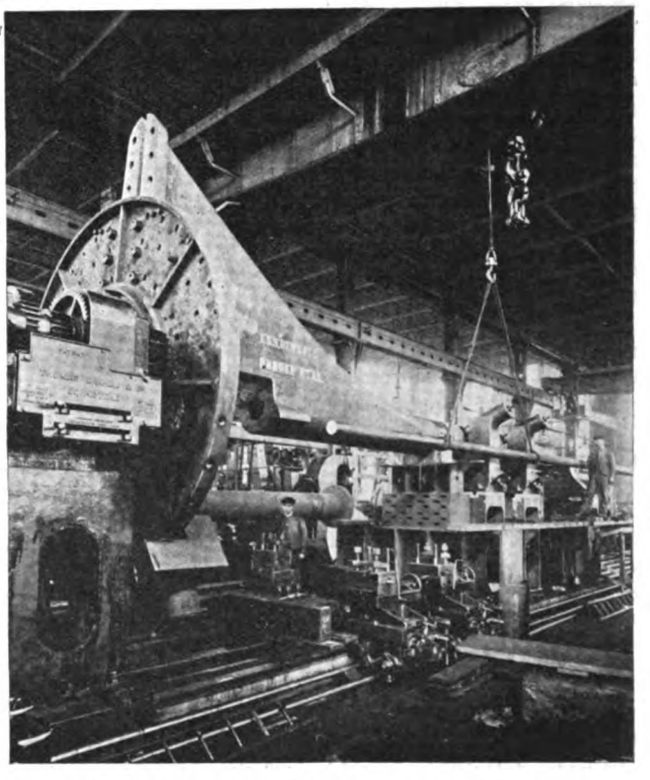
very pleasing and symmetrical appearance. As illustrating the importance of the riveting in this vessel, there are half a million rivets in the double bottom alone, weighing about 270 tons, the largest rivets being 1¼ in. in diameter; and in the complete ship there will be something like three millions, weighing about 1,200 tons.

The following particulars will also be found interesting: The largest shell plates are 36 ft. long, weighing 4¼ tons each; the largest beam 92 ft. long, the weight of the double beam being 4 tons; the stern frame weighs 70 tons; the after boss arms 73½ tons, the forward 45 tons; the rudder 100 tons; the engine crank shafts 118 tons each; bedplate 195 tons; columns 21 tons each; the heaviest cylinder, with liner, 50 tons; wing propellers each 38 tons—finished weights. The castings for the turbine cylinder weighed 163 tons, and for the center (turbine) propeller, which is of solid bronze, 22 tons.

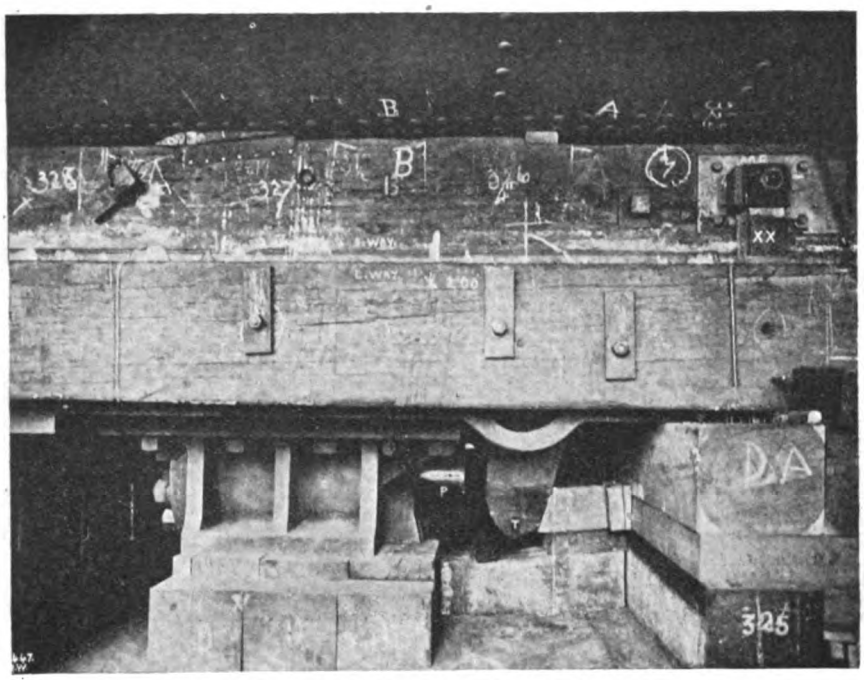
For checking the vessel after leaving the ways, three heavy anchors were placed in the bed of the river on each side of the ship, each anchor being connected by a 7-inch steel-wire hawser to eyeplates riveted to the shell plating. There were also placed in the bed of the river two piles of cable drags, each weighing over 80 tons, connected in a similar manner with an 8-inch steel-wire hawser. These were all arranged so that when the vessel was nicely clear of the end of the slip the drags and anchors acted simultaneously in bringing the



STEERING QUADRANT S. S. OLYMPIC.



RUDDER HEAD OF S. S. OLYMPIC IN LATHE.



HYDRAULIC LAUNCHING TRIGGER S. S. OLYMPIC.

ship to a standstill. As a further precaution the ship's own bow anchors were stowed in the hawse pipes, ready for letting go in case of emergency. So effectual were these methods, that from the time the triggers were released, allowing the vessel to move, until the "Olympic" was stationary in the water, less than two minutes elapsed.

As already announced, the machinery decided on for the "Olympic" and her sister ship "Titanic" is the combination of reciprocating engines with a low pressure turbine, so successfully adopted in the White Star Canadian liner "Laurentic," this arrangement having proved the most satisfactory from an engineering point of view. As there will be accommodations for about 2,500 passengers in all, besides a crew of 860, this arrangemennt is in keeping with the well-known practice of the White Star Line in making the comfort and safety of the passengers their first care. Full advantage is being taken of the enormous size and spaciousness of the vessel to excel anything hitherto attempted, both in the public rooms and private cabins; and the entrances, the magnificent staircases and other features will be on a scale of unrivaled magnitude and excellence, to say nothing of such items as the swimming bath, gymnasium, palm court, etc.

A New Boat Detaching Device

A new detachable shackle which may be used for lashing a life boat in the chocks or cradles as well as for releasing the falls, has been invented by John T. Kinney, Buffalo, N. Y., and is illustrated in the line engravings herewith. Essentially it consists of a hook with an elongated bill combined with a tripping device which is carried by a ring in the eye of the lower block or in the lower end of the gunwale hooks.

The first step in the operation of launching a life boat is necessarily the casting adrift of the lashings by which the boat is secured in the chocks. Figs. 1 and 2 show the manner in which the Kinney detachable hook is applied for this purpose. By leading the tripping lanyards of all four lashings to a common point all can be cast off simultaneously and in casting off the boat falls both can be let go at the same instant, a matter of no small importance in launching in a seaway, and it is not necessary that the strain shall be entirely off the shackles in order to do so, a condition essential to the operation of

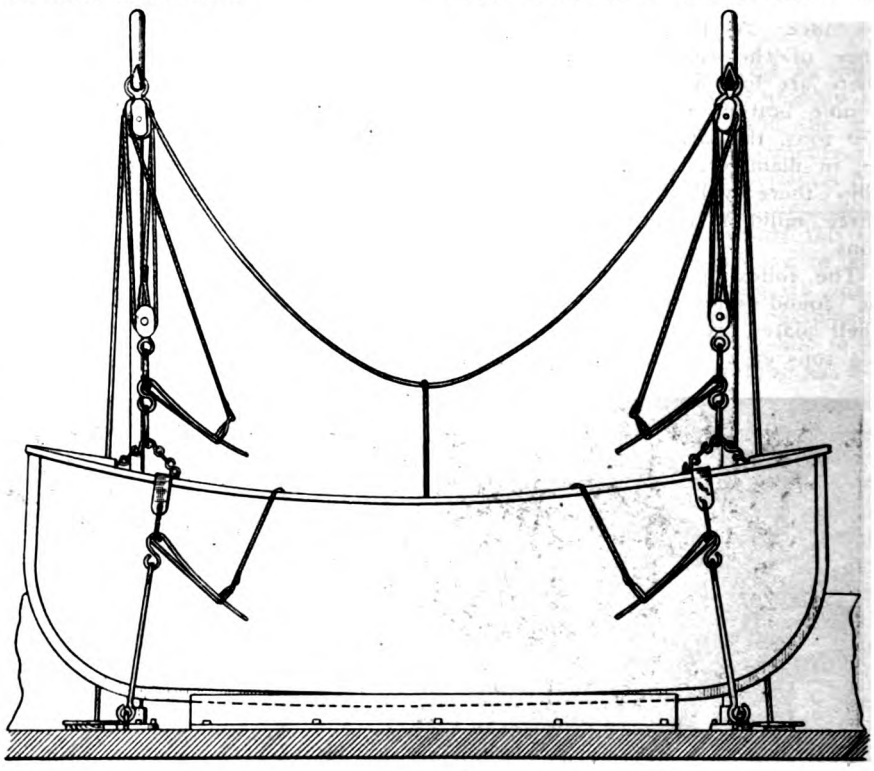


FIG. 1.

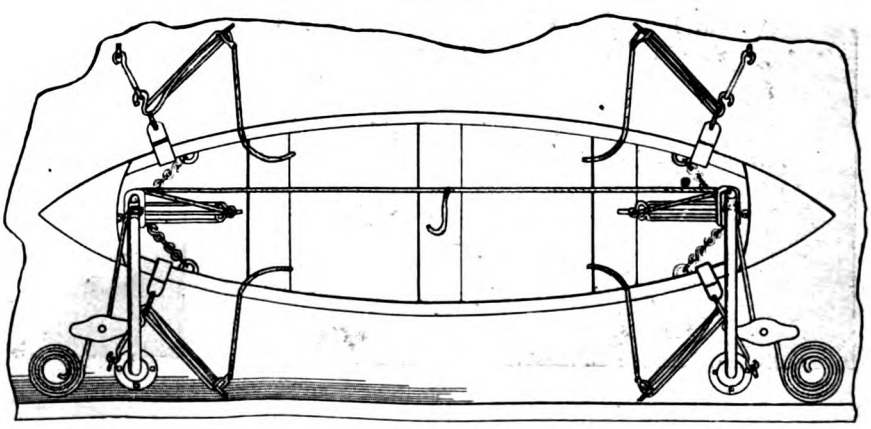


FIG. 2.

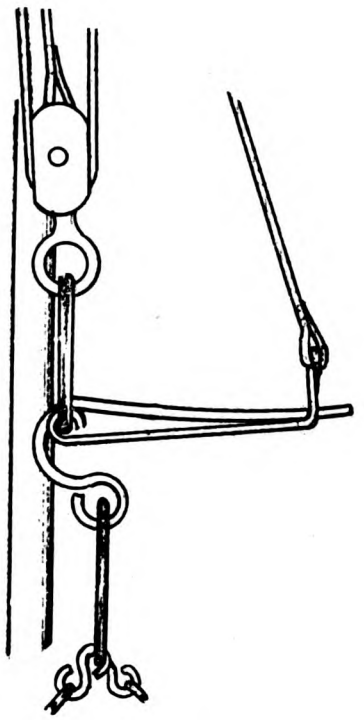


FIG. 3.

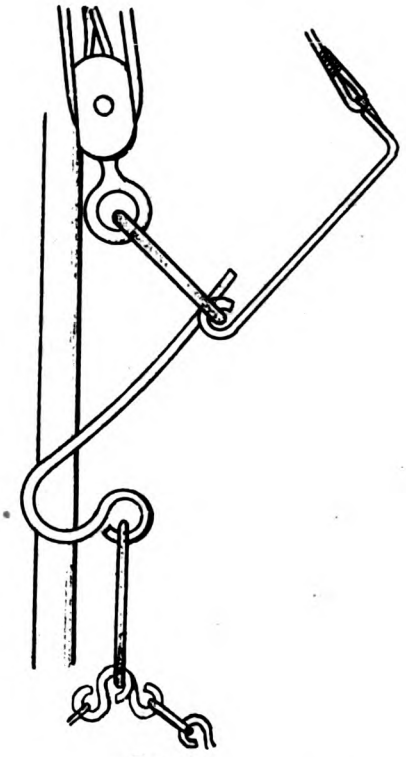


FIG. 4.

FIG. 5.

most boat detaching devices. The lanyard controlling the detaching device can either be taken overboard with the boat or be retained on board as preferred or as may be necessary, in which respect this device differs from all others. The device can be released in 20 seconds.

Figs. 3 and 4 in connection with Fig. 1 show plainly the method of operation. One of the strong points in connection with this device is that its operation is not liable to be interfered with by snow or ice because, as will be readily understood, even though it should be iced up, it is of such a form that a slight rap will readily restore it to condition for immediate action. The construction of the device is plainly shown in Fig. 5, from which it will be noted that wrought iron and steel rod is used throughout.

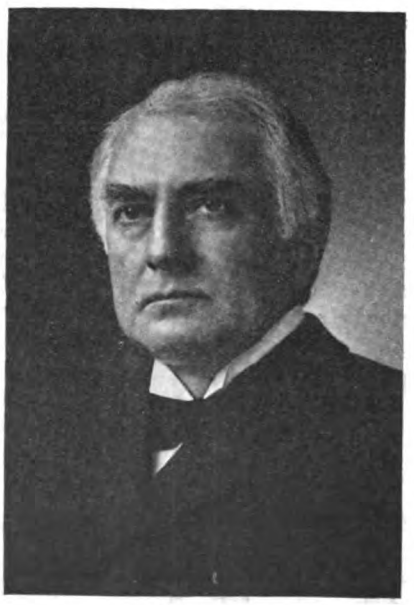
The device is being manufactured by Kinney Bros., 150 O'Connell avenue, Buffalo, N. Y.

New Law Firm

Messrs. S. H. Holding and F. S. Masten, who retired from the firm of Goulder, Holding & Masten on Oct. 15, have formed a partnership under the firm name of Holding, Masten, Duncan & Leckie, with offices in the new wing of the Rockefeller building. As noted elsewhere, Mr. Goulder continues business in the old offices. Messrs. Duncan and Leckie were former employes of the old firm.

Mr. Holding was born in Philadelphia in 1858. He studied law in the office of the Hon. Daniel Dougherty and was admitted to the bar on March 9, 1880. He came west during that year and entered the legal department of the old Bee Line railway, serving as assistant general attorney until 1886, when he resigned and went to Cincinnati, forming a partnership with C. B. Matthews, brother of Judge Stanley Matthews of the United States supreme court. He entered the legal department of the Big Four railway as assistant general attorney in 1887 and was with that railway until 1893, when he resigned and came to Cleveland. In January, 1893, he associated himself with Mr. Goulder under the firm name of Goulder & Holding, but continued to try cases for the Big Four throughout Ohio. He continued his association with Mr. Goulder until the present year, though the firm name had changed as new partners were admitted. Mr. Holding is the president of the Civil Service Commission, the only public office he has ever held.

F. S. Masten was born in Mahoning county, O., in 1865. He graduated from the Northeastern Ohio Normal college in 1885, and studied law in the legal department of the Big Four railway under the direction of H. H. Poppleton and S. H. Holding. He was admitted to the bar in 1893 and re-



S. H. HOLDING.

F. S. MASTEN.

T. H. DUNCAN.

F. L. LECKIE.

mained in the office of the Big Four railway until the fall of 1893, when he entered Goulder & Holding's office as law clerk, later being admitted to partnership. He is a member of the Colonial and Rowfant clubs, is a Mason, having attained the thirty-second degree of the Scottish rite, is a Mystic Shriner and a member of the Royal Order of Scotland.

Tracy H. Duncan was born in Toledo, though he has lived in Cleveland pracically all his life. He graduated from the Western Reserve college and law school in 1903 and he is instructor in marine fire and life insurance at the Western Reserve university law school.

Frederick L. Leckie is a native of Port Huron, Mich. After graduating from the high school he sailed for a number of years, passing through the various grades of sailing and has held a master's license ever since he was 21 years old. He is a veteran of the Spanish-American war, having served in the regular army during the Porto Rican campaign. He is treasurer of the Ship Master's Lodge of Cleveland.

Pacific Coast Coal Test

It was expected that the comparative test of eastern and western coals would begin the first of the coming month, but it has been found necessary to postpone that event until early in December, when the Maryland and West Virginia shall have completed their target practice. The naval collier Saturn has been loaded with 800 tons each of three prominent state of Washington coals and is already in San Francisco bay awaiting the availability of the two vessels of the Pacific fleet which have been assigned to this duty. The test will be conducted with a view to obtaining information for the guidance of the Navy department in the matter of coal obtained on the west coast. Representations have been repeatedly made to the navy department that fuel from that source is equal to the coal which is purchased from eastern mines, in which event, of course, there will be an appreciable saving in transportation. There has been, on the other hand, considerable doubt as to the suitability of the western product as compared with eastern coal for naval use, where it is desired to obtain the greatest steaming efficiency. The naval authorities would be much gratified if the test is conclusive, since the comparison along identical lines, such as is contemplated, will undoubtedly dispose of a vexatious controversy, which survives through succeeding administrations, an effort stimulated by the prospect of an enlarged market. It is planned to have the Maryland use the western coal, while the West Virginia will burn the eastern coal, proceeding on the cruise together in order that there may be identical conditions as to distance and weather. On the trip from Seattle to San Francisco the Saturn burned one of the Seattle brands of coal. It did not prove entirely satisfactory, according to the unofficial report which has been made of the incident.—*Army and Navy Register.*

The publication of the above paragraph drew the following reply from George F. Thorndyke.

Editor *Army and Navy Register:*—

My attention has been called to an article appearing in your issue of Oct. 22, entitled "Pacific Coast Coal Test."

The statements made therein, according to the best knowledge I have compels me to conclude that the *Register* partially misrepresented the facts.

The writer believes himself to be the first to have made complaint because of the navy department's policy in transporting Pocahontas coal to this coast in foreign tramps, dismissing those ships from its service on the Pacific coast, where they so competed with the business of the American owned vessels here that their business was demoralized.

My first utterance in remonstrance was contained in a letter addressed to Beekman Winthrop, acting secretary of the navy, in 1908, wherein I plainly represented the facts by stating to him that there was sufficient, efficient coal mined on this coast to enable the navy department, by its use, to produce practical results. That I was entirely within the truth when I made that statement is a certainty; my authority is unquestionable.

I am confident that records neither in the navy department, nor elsewhere, will show that anyone from the Pacific coast represented that coal mined here would equal in efficiency the Pocahontas, or any other preferable Atlantic coast coal.

It was stated to Mr. Winthrop that the Comox, B. C. coal, when tested at the Bremerton navy yard, a few years ago, lacked but 6 per cent of being as efficient as is the Pocahontas coal. I stated that some of the coal mined on the American side on this coast was customarily used in vessels of the Pacific Mail Steamship Co., United States army transports, and United States revenue cutters operating to Bering Sea, thought to be the most dangerous navigable body of water in the world. Other ships, required to maintain sea steaming equal to 17 and 18 knots daily, successfully use our coal. No one has attempted to disprove these statements and it would be asinine to do so.

The navy department, through an acting secretary, did promise to make several tests of Pacific coast coal, commencing in November next. In confirmation of that promise there were some 2,700 tons of King county coal loaded on board the collier Saturn and transported to San Francisco, for the purpose of making the test. It was understood that the Saturn was to consume 300 tons of the coal loaded, as a side test; the balance was to be consumed by the cruiser Maryland. The navy department has failed us before with regard to this fuel proposition, so we now feel that there is no intention to make a fair test of the Pacific coast coal. We want no stronger reason for arriving at that conclusion than to know that the navy department intends to keep our soft bituminous coal in storage in excess of sixty days before consumption. The reason for that we quite well understand.

We have now given up hopes that a fair test will be made and doubt if a test of any kind is made. We feel confident the postponement of the tests until December was made as an excuse to enable the department to ship another consignment of Pocahontas coal to this coast about the first of the year 1911. We are constrained to believe this, because a little over a year ago an authoritative official of the navy department stated, when in Seattle, that it was then the expectation of the navy department to use naval colliers to some extent in handling Atlantic coal to the Pacific coast, and that he hoped that policy would be adopted before it became necessary to place contracts for coal about January 1, 1910, a promise never kept, nor probably intended to be kept.

As regards the kind of coal bought and shipped on the Saturn to make the test: For your information would

state that only one of the three kinds selected has a good reputation as a marine steam fuel.

It is apparent that a sufficient effort was not made to exclude from the test such coals as were without reputation as a marine fuel, which could easily have been arranged through our commercial bodies in Seattle.

That ships of the old white squadron did customarily use Pacific coast coal is unquestionable.

That the battleship Oregon made her best record when consuming Pacific coast coal incident to her famous voyage from the Pacific to the Atlantic is unquestionable.

That the French cruiser Montcalm recently secured very good results from Seattle coal, which fuel was afterwards complimented by her chief engineer, is unquestionable.*

That two Japanese cruisers burned quantities of Seattle coal during 1909, and obtained satisfactory results, is unquestionable.

That the navy department declines to purchase Comox, B. C., coal because it is mined without the United States, which coal could be bought for about $4 per ton, yet the department has for three years chartered hundreds of thousands of tons of foreign ships at more than that figure per ton to transport Atlantic coal to this coast is unquestionable. All employes on these tramps are aliens and often times Asiatics.

That Comox, B. C., coal is mined in territory contiguous, and within close proximity to the United States; many of the miners employed in British Columbia mines are Americans; much of the corporate investment is American, and that said coal is distributed in this country by an American company is unquestionable.

The present proposed test is unnecessary, and unwarranted, because the department has abundant evidence of the practicability of Pacific coal. That we whose business has been demoralized by the department's policy are within the spirit of right when we seek remedial legislation is unquestionable.

The Pacific coast is now completely aroused on the question of supplying fuel to the Pacific cruiser fleet, but we are about to end our negotiations with the navy department, and have concluded there is but one way to solve this question, and that is to take it out of the hands of the navy department officials by the enactment of a law preventing the present shipments of Atlantic coast coal to the Pacific in foreign vessels.

Yours very truly,
(Signed) G. F. THORNDYKE.

THE MARINE REVIEW long since foreshadowed the action of the department with regard to Pacific coast coal. There is no desire nor intention to conduct impartial investigation into this question. The reasons given for using Eastern coals are not the truth and will not bear the light.

The department says that Alaskan coal when available will probably be satisfactory. It will if the proper parties get control of it. Some high naval authorities, including Admiral Evans, of noisy fame, profess to believe that the Pacific will be the theater of our naval activities; if they are right what in the name of Heaven will our ships do if they are dependent on eastern fuel? Will it be a convenient excuse for keeping all snug (and safe) in port?

*See October MARINE REVIEW.

Accidents to Lake Vessels

Altogether 45 accidents occurred to lake vessels during October. The most important loss, of course, was that of the steamer W. C. Moreland, owned by Jones & Laughlin, of Pittsburg, and managed by W. H. Becker, of Cleveland, which stranded on the rocks at Eagle Harbor, Lake Superior, on Oct. 18, with a cargo of 10,700 tons of ore. The Moreland came out only last September, having been built at the Lorain yard of the American Ship Building Co., and was regarded as one of the finest freighters on the lakes. The particular location where she fetched up is one of the most dangerous on the lakes, owing to its exposed position. Heavy weather prevented the wreckers from working on her steadily and she was finally abandoned to the underwriters. The latest report says that the Moreland is broken into three parts of nearly equal length. There are two breaks in the hull at Nos. 12 and 24 hatches which extend below the tank top and in order to recover her it will be necessary to bulkhead both sides of each break. About all that is really worth saving is the after hold with machinery and boilers. The probability is that the Moreland will be completely destroyed, entailing a loss to the underwriters on hull, cargo and wrecking cost of about $500,000. The Reid Wrecking Co. has the contract to salve her.

The package freight steamer Wasaga was burned to the water's edge at Copper Harbor on Sunday, Nov. 6. She had a cargo of general merchandise and was bound for the head of the lakes. Her cargo, which was valued at $56,000, was insured.

The steamers Martin Mullen and James H. Reed were in collision in St. Clair river. Both vessels were quite badly damaged, the Mullen later docking at Superior and the Reed at Lorain.

The steamer C. W. Kotcher stranded at the Limekiln Crossing, Detroit river, and had to lighter 1,200 tons of her coal cargo. She practically blocked the channel during the night time, as no vessels were permitted to pass. In the day time vessels could pass with the aid of tugs.

There were four total losses, the Lycoming, which was destroyed by fire at Rondeau; the Langham, which was burned off Keweenaw Point, Lake Superior; the Wasaga, as mentioned, and the Moreland. The usual table of accidents is withheld for a month.

Commerce of Sault Canal

The commerce of the Sault canal for October amounted to 7,868,793 tons, showing a falling off as compared with the commerce of any of the preceding months of the present year. This, of course, was to be expected, as the ore slump was quite drastic during October. The commerce to Nov. 1, however, totals 56,705,967 tons, as against 48,166,688 tons for the corresponding period last year, an increase of 8,539,279 tons. Following is the summary:

	To Nov. 1, 1909.	To Nov. 1, 1910.
EAST BOUND.		
Copper, net tons	94,230	115,373
Grain, other than wheat, bush.	26,311,621	29,849,662
Building stone, net tons	1,674	9,485
Flour, bbl.	5,162,355	6,114,481
Iron ore, net tons	34,395,380	39,006,737
Iron, pig, net tons	30,663	31,728
Lumber, M. ft. B. M.	484,412	544,886
Wheat, bush.	69,048,988	62,296,174
Unclassified freight, net tons	128,797	142,455
Passengers, number	29,011	30,955
WEST BOUND.		
Coal, anthracite, net tons	1,106,097	1,411,345
Coal, bituminous, net tons	7,210,733	10,549,041
Flour, bbl.	3,700	1,110
Grain, bush.	5,750	2,153
Manufactured iron, net tons	376,931	328,253
Iron ore, net tons	15,573	3,248
Salt, bbl.	531,065	483,529
Unclassified freight, net tons	771,169	1,053,708
Passengers, number	29,823	33,944
SUMMARY OF TOTAL MOVEMENT.		
East bound, net tons	38,606,780	43,288,425
West bound, net tons	9,559,908	13,417,542
Total	48,166,688	56,705,967

The total number of passages to Nov. 1, 1910, was 18,825, and the net registered tonnage, 45,746,345.

Personal

The firm of Nacey & Hynd, marine architects and consulting engineers, has been dissolved and both will continue in business independently hereafter. Mr. Hynd has opened an office at 872-874 Rockefeller building, Cleveland, while Mr. Nacey will for the present continue in business in the old office, at 208-209 Western Reserve building.

The Overman & Schrader Cordage Co., Covington, Ky., has recently issued a little catalog regarding their products. They make an extensive line and as regards manila rope are among the largest manufacturers in the country. They also carry an extensive line of commercial twines for the general trade.